

LATERAL LUXATION OF IMMATURE MAXILLARY CENTRAL INCISOR AND AVULSED CONTRALATERAL; A CLINICAL CASE REPORT

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ABSTRACT

Displacement of the tooth other than axially is defined as lateral luxation injury. It is one of the traumatic dental injuries that are common among children. Permanent incisors are the most susceptible to trauma where pulp response may vary according to severity of trauma and stage of tooth development.

Avulsion is the complete displacement of the tooth out of socket.

This is a case of 7 year old boy documenting the detailed history, clinical and radiographic assessment, management and follow ups of a laterally luxated immature central incisor with fractured alveolar process and avulsed contralateral after falling accidentally while riding a bicycle.

Key words: Luxation, immature incisor, avulsed lateral

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INTRODUCTION

Dental trauma is an important health problem, due to high prevalence, especially among children and teen ages.¹ Treatments for these younger age groups may be different than in adults, mainly due to immature teeth and pubertal facial growth.² It may cause functional, developmental and psychological side effects due to compromised aesthetic with possible other complications. After recording the medical history, clinical examination and exclusion of CNS involvement, management should start as soon as possible taking into consideration many factors like: extraoral time of avulsed tooth, age of the patient, stage of root development, pulpal status and severity of trauma.

Epidemiological studies indicate the annual incidence of dental trauma globally is at about 4.5%.³ The permanent incisors are the most traumatized teeth at home accidents or during sport practice.⁴

Lateral luxation injuries are one of the most dental trauma injuries experienced. The current literature reports that lateral luxation make up 29.5%-57% of

all dental injuries.⁵

The common aetiologies include oral factors (over jet), sport activities, traffic accident, bicycle and car related injuries and some form of violence.⁶

The WHO classification of traumatic dental injuries subdivides luxation injuries into five types: concussion, subluxation and extrusive, intrusive and lateral luxation.⁷

Lateral luxation injuries are the displacement of the tooth other than axially. Displacement of the tooth in any lateral direction usually associated with a fracture or compression of the alveolar socket wall or facial cortical bone.²

Avulsion is a complete displacement of the tooth out of its socket in the alveolar bone it is seen in 0.5%-16% of all dental injuries.⁸

This case report presents multiple dental traumatic injuries, including lateral luxation of immature central incisor and a lost avulsed contralateral with detailed description of the diagnosis, management and follow up.

The study was approved by the Ethical Committee of The Royal Medical Services.

Patient's parents were informed about the aims

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and methods of this study, and they provided written consent to participate.

CASE REPORT

An eight year old boy was referred to the paediatric dental clinic in Prince Ali Hospital complaining of pain in the site of lost tooth and displaced another due to accidentally falling down while riding a bicycle the day before. As reported by his mother they attended the ER at the day of trauma for medical assessment. Exclusion of CNS involvement and any possible fractures was performed by the medical staff and the patient was referred for further dental management. The patient entered the clinic walking steadily but looked unwell with swollen upper lip. Medical history was recorded. The patient was medically free with no allergies, no current medication and vaccinations up to age.

Extra oral examination

The patient presented with a diffuse swelling on the right side of his face. There was an old abrasion on the left side. Can be seen in (fig-1). And had no TMJ pain or occlusal displacement.

Intra oral examination

Lacerated upper gingiva, lost avulsed upper right central incisor, the upper left central incisor was immobile, severely palatally luxated, tender, with no discoloration, fractured alveolar process with a step palpable labially (Fig-2). Chest x-ray was ordered to exclude aspiration of the lost avulsed tooth.

Radiographic examination

OPG, Lateral Ceph, occlusal, periapical x-rays were taken (Figures- 3,4,5,6).

Management

International Association of Dental Traumatology Guidelines for the Management of Traumatic Dental injuries: 1. Fractures and Luxations were followed.

Labial and palatal infiltration local anaesthesia was given using 4% articaine with 1:100,000 epinephrine. Empty socket was irrigated. Labially lacerated upper gingiva was cleaned and debridement and disinfection of abrasions were performed.

The upper left central incisor was surgically repositioned into the original alveolar socket by forceps (Fig-7,8).

Periapical x-ray was taken to confirm the repositioning of the tooth (Fig-9). Upper left primary lateral was about to exfoliate, therefore extraction was performed. 4 vicryl 03 stitches were applied into the lacerated gingiva as shown in (Figure-10). Splinting using a flexible orthodontic wire and composite resin

on the labial surface of the traumatized tooth and the adjacent primary teeth was set for four weeks.

Base line vitality pulp test was positive and throughout the 3 months follow up visits as well

Antibiotic (amoxicillin 250mg/5ml) and analgesic (paracetamol 250mg/5ml) were prescribed for one week. Oral hygiene instructions, soft diet, and avoidance of participation in sport activities were recommended. First follow up visit was after 2 weeks; patient had no complains. There was improvement in tooth mobility. No tenderness was noticed. And upper labial gingiva was healed. The periapical x-ray revealed no abnormalities. Unfortunately the patient had poor oral hygiene therefore reinforcement of instructions was performed (Fig-11).



Fig 1: (8 year old boy with diffuse swelling on the right side of his face old abrasion on the left side).



Fig 2: (Lacerated upper gingiva, lost avulsed upper right central incisor).



Fig 3



Fig 4



Fig 5



Fig 6

(11: empty socket, 21: widened PDL space apically, immature severely labially luxated root).



Fig 7: (surgically repositioned 21).

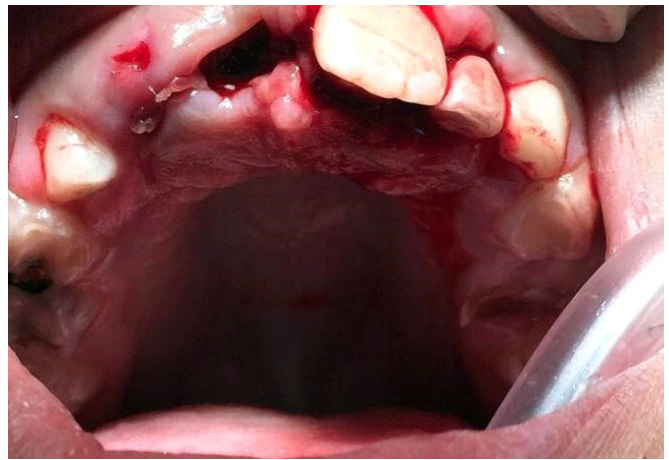


Fig 8: (surgically repositioned 21).



Fig 9: (confirmation the correct position of the traumatized tooth , flexible orthodontic wire composite and resin splint).



Fig 10: (4 vicryl 03 stitches were applied into the lacerated gingiva).



Fig 11: (2 weeks follow up visit , food accumulation around splint).



Fig 12: (4 weeks follow up, splint removal, improvement in tooth mobility ,no tenderness and healed upper labial gingiva).



Fig 13: (3- months follow up visit with removable partial denture).

The second follow up visit was after one month. The patient had no complains .The mobility was within normal limit. There was no tenderness or discoloration. Vitality test was positive. No periapical x-ray abnormalities were detected. Oral hygiene had improved and splinting was removed (Fig-12).

Impression was taken for a provisional removable

partial denture.

Temporary replacement for the avulsed central incisor taking into consideration the need of refabricating a spoon denture in the next follow up visits; due to the growing maxilla and eventually replacement by an implant, or a fixed bridge.

The third follow up visit was after three months. The patient and the parents were both satisfied. The patient had no complains, no tenderness, no discoloration, positive response on vitality test, and no periapical x-ray abnormalities. The removable denture was still fitting) fig-13).

The case still needs follow up in 6 months, 1 year and yearly for 5 years, the importance of patient compliance and long term follow up visits were discussed with the parent s and the patient

DISCUSSION

This was a clinical case of dental trauma in eight year old boy, who sustained different types of injuries to his immature maxillary permanent incisors. The upper right central incisor was avulsed and the upper left central incisor was surgically repositioned. Immature permanent teeth has a great capacity of post traumatic healing and the prognosis is favourable even with late repositioning.¹ Although it makes the procedure more difficult, so it's always preferable to manage the case as soon as possible.

The splinting time after lateral luxation is considered important to maintain the traumatized tooth in right position, facilitating the bone alveolar process and periodontal ligament healing.⁹ However, Longer splint periods and rigid splint increase the risk of healing complications.¹⁰ Accordingly flexible splints for shorter periods of time are considered more suitable.¹¹ In this case the surgically repositioned tooth was stabilized with flexible composite bonded wire splint for 4 weeks.

Pulp vitality testing with immature teeth can be misleading because full development of plexus of raschkow and full pulpal innervation with A delta nerve fibres takes place after root formation has been completed.⁷ In this case the cold and the electrical pulp tests were applied to traumatic tooth. There was positive response to vitality test, on the day of treatment and in the follow up visits.

Pulp outcome of lateral luxated permanent teeth could be as pulp necrosis, calcifications and survival. Root development and the age have been previously reported to be the most influential factors for pulp necrosis in traumatized teeth.⁵ Overall pulp canal obliteration was the most frequently reported complication of lateral luxation injuries⁵. However the pulps of luxated teeth with incomplete root formation have

a higher rate of survival than those with complete root formation and closed apices.¹²

Immature teeth have better PDL healing than those with mature teeth. Longitudinal cohort studies of 469 concussed, 404,subluxated,82extruded and 179 laterally luxated teeth which were followed at regular intervals of weeks ,months and years determined that after 3 years the risk of periodontal ligament healing complications was generally low for mature teeth and very low for immature teeth.^{13,14}

After 3months follow up visits, there were no complications or abnormalities clinically and in periapical x-ray and the tooth remain vital.

Regarding the avulsed tooth, when traumatic injury causes the loss of child's tooth, anatomic consideration of size the size of the pulp, continuing soft tissue changes as the teeth continue to erupt any other growth and development that will occur preclude the use of a crown fixed ,partial prosthesis.¹⁵ To restore aesthetic ,maintain the space and replace the missing tooth, a removable partial denture was fabricated, taking into consideration the need of refabricating of spoon denture with time because of growth of maxilla.

CONCLUSION

This case demonstrate that careful diagnosis, treatment, monitoring and assessment are necessary to follow the prognosis for a favourable healing outcome of traumatically luxated immature permanent maxillary incisor. The primary goal in the treatment of children who sustained luxation injuries should support the healing potential that already is inherited in their developing oral dentoalveolar tissue.

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CONTRIBUTIONS BY AUTHORS
All authors contributed substantially