

# Management of Sub-Luxation Injury to Teeth: A Conservative Approach

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## ABSTRACT

Accidental trauma to dental tissue may vary from luxation injury within socket to tooth avulsion. This injury may cause different kinds of damage to dental hard tissue, soft tissue as well as periodontal tissue. Treatment approach varies according to degree of injury. In this type of trauma endodontic treatment is indicated only when signs of pulp necrosis are present. The treatment approach of four luxated teeth with a follow-up for four year is presented in this case report.

**Key Words:** Sub-Luxation injury, Conservative dentistry, Periodontal ligament space.

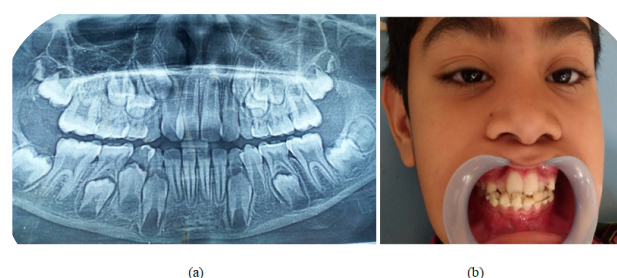
## Introduction

Traumatic injuries cause different kinds of damage to dental and periodontal tissues. The treatment approach varies according to the type and degree of injury. Epidemiological studies indicate that dental trauma is a significant problem in young people and that incidence of trauma exceeds that of dental caries and periodontal disease in the population [1]. In traumatic cases, clinician faces hard tissue injuries, periodontal injuries or combination of both. So, the objective of treatment of traumatically injured teeth is to provide functional and aesthetic rehabilitation [2]. The treatment modality is planned according to the type and degree of injury as well as delay until treatment. This case report present the treatment process of traumatically injured teeth including stabilization of sub luxated teeth and endodontic treatment of one of those teeth over a 4 years follow up period.

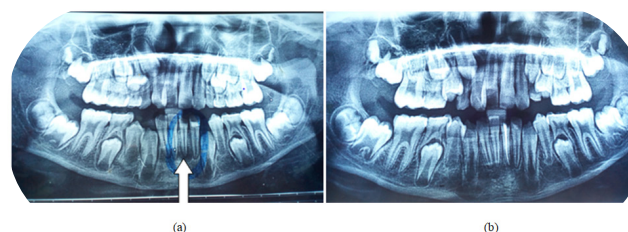
## Case report

A 10-years-old boy presented to department of Conservative Dentistry and Endodontics, Update Dental College with complaint of bicycle trauma to the anterior mandibular region one day back. Clinical examination confirmed crown fracture to tooth no. 31 not involving pulp with trauma to lower lip. However, the tooth no. 32, 41 & 42 were horizontally luxated but displacement of those teeth was not evident. All the three affected teeth (teeth no. 32,41,42) represented only slight mobility (Grade-1) while tooth no. 31 presented a higher degree of luxation (Grade-2). Intra oral examination revealed no laceration or any other soft tissue damage. Radiographically, no alveolar bone fracture and root resorption was detected. Periodontal ligament of laterally luxated teeth were enlarged at entire root surfaces. There was no spontaneous pain to these luxated teeth but pain on biting was present (*Figures 1a and 1b*).

Thermal vitality test with warm gutta percha stick gave positive result. The sub luxated teeth were splinted with a 0.5 mm SS orthodontic wire bonded to labial surfaces of the affected teeth along with two adjacent sound teeth by using composite resin (TPH, Densply, USA). In order to preserve the luxated teeth in their normal position and to prevent them from occlusal forces, bite adjustment was done to keep the teeth in resting condition. The patient was advised to avoid biting with his anterior teeth (*Figures 2a and 2b*).



**Figure 1:** (a) Initial radiograph showing widened periodontal ligament space indicating sub luxation of tooth no. 31,32,41,42, (b) Functional splinting of mandibular canine to canine.

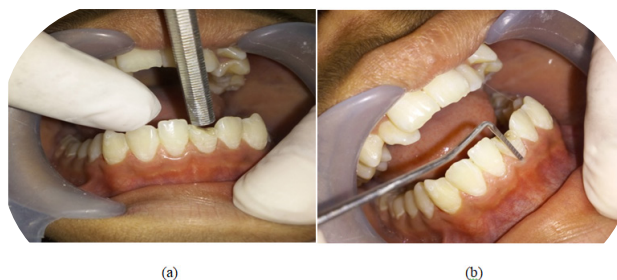


**Figure 2:** (a) Radiographic presentation, and arrow indicating periapical radiolucency at root area of tooth no. 31, (b) Endodontic treatment of that tooth after 3 months of accident.

After 4 weeks, splitting was removed and no laxative mobility was noticed. At 1 month recall, Patient was symptomless and x-ray revealed reducing of periodontal space near normal. A 3 months follow-up patient was complaining about periapical swelling and dull pain to tooth no. 31. Then the tooth was confirmed non-vital by vitality test with warm gutta percha and root canal treatment was done. The root canal was obturated with standardized gutta percha cone and zinc oxide eugenol sealer followed by composite core buildup. 1 year later, clinical evaluation confirmed no abnormality such as pain, luxation or percussion pain. At 4 year follow up, patient was comfortable with the teeth (*Figures 3a and 3b*), (*Figure 4*).

Radiology after 3 months showed complete resolution of widened periodontal ligament space and no root resorption at teeth no. 31,32,41,42. Apical radiolucency of subluxated tooth no. 31 was significantly smaller at this visit. After 4 year, patient was quite ok with the teeth. At that period, periapical view of the teeth gives complete healing of the periodontium.

Furthermore, any complication associated with gingival and other soft tissues, discoloration and fracture of restoration was not detected and was advised for aesthetic build up.



**Figure 3:** (a) Percussion test 1 year later; (b) Measurement of periodontal pocket after 4 years.



**Figure 4:** At 4 years follow up.

## Results and Discussion

If the sub luxation occur due to trauma there may multiple teeth involved symptomising initially, but with time the acute symptom will subsided and vitality report become normal which was exaggerated previously. As the teeth were not out of socket some teeth facing the traumatic force to lesser extent may re-establish the apical re-vascularization. For this reason, traumatically injured teeth must be observed for a period of time after splinting to avoid unnecessary endodontic treatment. Flores et al. reported that no radiographic abnormalities will be found in sub luxated teeth [3]. However, Caliskan observed that enlargement of periodontal membrane may be observed [4]. In this case report subluxated teeth represented radiographically enlarged periodontal membrane.

In comparative study on 4 different splinting technique Von Arx et al. suggested that a functional splint should be firm enough to stabilize a traumatic teeth but also should be flexible enough to functionally stimulate periodontal healing [5]. Caliskin stated that subluxation injuries does not require immobilization by splint but many be considered of necessary while Flores et al. stated a flexible splint option can be used for 7 to 10 days [3,4]. Bakland and Andreasen stated that in cases luxation, the splint should be removed three to four weeks after trauma [6].

In our case, a functional splint with 0.7 SS orthodontic wire bonded to the labial surfaces of the adjacent two sound teeth on each side was done along with composite restoration.

In subluxation injuries, the teeth are tender to touch and mobile but not displaced [3]. Barnett reviewed that pulp necrosis is rare in these cases but sign of pulp necrosis such as, development of periradicular lesion, external root resorption, sinus tract

formation, pain to percussion or development of tooth mobility after the initial healing period require immediate endodontic intervention to prevent progressive inflammatory resorption [7]. In this case spontaneous pain, swelling and biting pain observed 3 weeks after trauma and root canal treatment was initiated.

In context of restoration of that tooth after completion of root canal treatment glass fibre post supported composite core build up is advised as the tooth was anterior having not that much occlusal load like molar. Glass fibre posts are more flexible than metal post and have approximately the same modulus of elasticity as dentine. They also have superior esthetic result [6]. Pest et al. concluded that adhesive luting of fibre posts is an alternative technique that is comparative and in some way superior to traditional technique [8,9]. In the present case coronal restoration of left maxillary central incisor was accomplished with composite resin was done and reinforced with glass fibre post was advice in following visit.

## Conclusion

This case presented the management strategy of traumatically injured teeth including fixation of luxated teeth and endodontic treatment of one of the severely injured tooth. Periodic follow up for 4 years proved successful maintenance of vitality of other teeth without endodontic treatment.

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