



# Lateral Luxation of A Permanent Mature Incisor in A Thirteen-Year-Old Male Patient: A Case Report

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## Abstract

Dental trauma of permanent teeth is often the subject of emergency consultations, especially when they are the cause of spectacular lesions such as dental expulsion, lateral luxation, and pulp exposure. Therefore, the purpose of the immediate treatment is to maintain pulp vitality and periodontal health of the tooth. The prognosis of these traumatized teeth depends on the type of dental trauma, the emergency treatment and the time elapsed between the trauma and the treatment. The present report aimed to describe a clinical case of a lateral luxation of the left central maxillary incisor (#21) and uncomplicated crown fracture of the upper right incisor (#11) in a 13-year-old boy. The management of the trauma consisted of reduction and splinting of the tooth 21, and indirect pulp capping of the tooth 11.

No signs of complications were reported after 12-months follow-up period.

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**Keywords:** Dental trauma; Emergency; Fracture; Maxillary central incisor; Palatal luxation; Splint.

## Introduction

Dental trauma can be isolated or associated with pan-facial or bodily injuries.

Trauma injuries had a global prevalence of 10 to 15% [1] and dental lateral luxation constitutes one of the more severe trauma that affect not only the teeth but also its surrounding tissues.

A lateral luxation is defined as a traumatic displacement of a tooth in any direction other than axially [1].

Because of its bony lock, a laterally luxated tooth is often immobile, and percussion produces a high, metallic sound. Pulp

sensibility testing will likely be negative during the initial follow up. However, the tooth should be monitored until a definitive pulp diagnosis can be made, considering the risk of pulp necrosis following lateral luxation [2].

The prognosis of luxated teeth depends on the emergency treatment, the time elapsed before The present report aimed to demonstrate through a clinical case, the clinical management a lateral luxation of the left central maxillary incisor (#21) and uncomplicated crown fracture of the upper right incisor (#11) in a 13-year-old boy.

The treatment consisted of the reduction and splinting of tooth 11, and indirect pulp capping of the tooth 21. No signs of

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clinical or/and radiological complications were noticed during the 12-months follow-up period.

### Case representation

A 13-year-old male patient was referred to the Pediatric and Preventive Dentistry Department at The Dental Clinic of Monastir one hour after a dental trauma that took place at the school yard.

The patient reported that he received a strong punch on the face while he was fighting with two of his classmates at school.

The patient medical history showed no systemic disease, and the child's health history was non-contributory. The tetanus immunization was current.

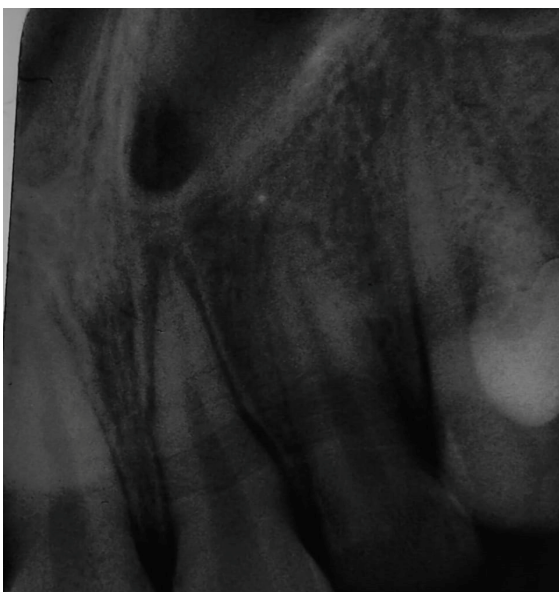
Extra-oral examination showed no signs of facial injuries.

Intra-oral examination showed a lateral luxation of the left central maxillary incisor (#21), associated with bleeding at the gingival sulcus, resulting from the injury of the periodontal ligament, and a coronal fracture without pulp exposure of the right central maxillary incisor (# 11) (**Figure 1**).



**Figure 1:** Intra-oral photograph illustrating the degree of displacement of the left incisor (#21), gingival bleeding and the degree of coronal fracture of the right incisor (#11).

The radiographic examination (intraoral periapical radiograph) demonstrated widening of the periodontal ligament space of the tooth 11 (**Figure 2**).



**Figure 2:** Pre-operative periapical radiograph of the tooth 21 showing a widening of the periodontal ligament space.

Immediate treatment consisted of repositioning of the Luxated tooth.

After performing a local anesthesia using a full cartridge of 2 percent lidocaine with 1:100,000 epinephrine, the left central maxillary incisor (#21) was repositioned by digital pressure.

The repositioning technique consisted of the use of digital pressure at the vestibular apical level along with digital pressure on the palatal side at the height of the crown.

Then, a splint was placed into the labial surface of the involved and the immediately adjacent teeth using resin composite (3M™ ESPE™) and 0.7 orthodontic wire.

The repositioned tooth was splinted for 2 weeks (**Figure 3 & 4**).



**Figure 3:** Intra-oral photograph illustrating the repositioning and splinting of the luxated tooth.



**Figure 4:** Post-operative radiograph.

Antibiotics (Amoxicillin®) was prescribed for use during one week, and paracetamol for the first 24 hours was prescribed to be used in case of pain every 6 hours.

Chlorhexidine 0.1% mouthwash was recommended for application on injured site, twice daily for ten days to reduce bacterial population.

Soft diet for a week and thorough instruction on proper oral hygiene with a post-surgical tooth brush were recommended.

For the right central maxillary incisor, a dentin lining was applied to close the dentinal tubules, to prevent entry of microorganisms, and to address patient discomfort.



In the present case report, Calcium Hydroxide (DYCAL®) was used to line dentin after cleaning the tooth, and covered with glass ionomer (a temporary restoration) (Figure 5).



**Figure 5:** Dentin lining with Calcium Hydroxide of the right central maxillary incisor (#11).

Intermediate treatment essentially consisted of monitoring the pulp condition (with vitality test) during check-up appointments. This monitoring was considered necessary because the dental response may vary after an acute dental trauma.

The left central maxillary incisor pulp necrosis was observed one week after the trauma. The dental vitality test was negative and the radiological examination showed no signs of complications. A root canal treatment was indicated one week after the trauma to prevent root resorption (Figure 6).



**Figure 6:** Root canal treatment of the left central maxillary incisor (#21).

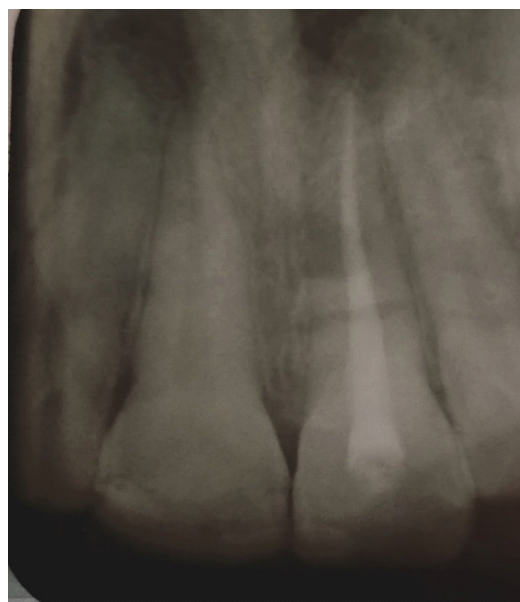
The splint was removed two weeks after and a coronary reconstruction with composite resin (3M™ ESPE™) of the two central incisors was performed at the same appointment (Figure 7).



**Figure 7:** Coronary reconstruction of the 11 and 21.

Follow-up appointments for clinical and radiographic assessment of the two central incisors were scheduled every two months for 18-months.

At 12 months follow-up, the present case showed no signs of clinical or radiographic complication (Figure 8).



**Figure 8:** 12-months periapical radiograph showing no signs of complication.

### Discussion

Dental traumas in immature permanent teeth are very common and these injuries affect about 30% of the children.

Maxillary incisors are the most frequently injured teeth in the primary and the permanent dentition and injuries in permanent anterior teeth are considered as a disturbing experience for both the child and the parents because of their location, esthetic, psychological and emotional importance [3,4].

Traumatic dental injuries should be considered as an emergency in case of exposure of the dental pulp, tooth avulsion, concussion, luxation and sub-luxation injuries [1].

A lateral luxation injury produces displacement of the tooth in a direction other than axial and render the tooth immobile [5].

Diagnosis is based upon both clinical and radiographic observations. The clinical inspection usually reveals a displacement of

the injured incisor's crown lingually or labially, but most commonly the crown is displaced lingually and the root labially.

The tooth is usually not mobile or tender to touch, due to its locked position in the alveolus and the cervical zone is aligned with the adjacent teeth and percussion may give a high metallic (ankylotic) sound [5,6].

Displaced and luxated teeth undergo damage to pulp and periodontium. In fact, localized ischemia may occur by rupture of the pulpal neurovascular supply and compression of the periodontal ligament cervically and its laceration apically [6,7].

Dental luxation requires immediate tooth repositioning since it produces occlusal interference and prevent correct mouth closure. The prognosis of luxation injuries is affected by treatment delay. Postponing the treatment can make the adequate tooth positioning difficult due to the presence of organized blood clot inside alveolar socket [1].

The stabilization of the traumatized tooth reduces or avoids pain, offers comfort to patient, and protects the teeth from traumatic forces during healing process.

The stabilization through using the adjacent teeth is considered the best solution to support the injured tooth at its right position and in function because it allows the exposure of the injured tooth to physiologic forces existing in the oral environment [7].

Flexible splints for short periods are recommended to decrease the risk of healing complications such as ankylosis and root resorption. The splint period for periodontal ligament therapy can range from two to four weeks [8].

In the present case, the splint was made from orthodontic wire and resin composite to stabilize traumatically luxated incisor. This technique has the advantage of using low-cost materials generally available in dental offices. Also, it leads to satisfactory outcomes because the characteristics decrease the risks of complications [7].

Monitoring pulpal condition (with vitality testing) in subsequent appointments is recommended since tooth response may vary immediately after acute dental trauma [5].

A study conducted by Elena C. et al. in 2008, reported pulp necrosis in 24.3% of laterally luxated permanent teeth within 12 months, and pulp canal calcification in another 24.3%.

Andreasen and Vestergaard-Pedersen reported a frequency of 58% for pulp necrosis in 122 laterally luxated permanent teeth [2].

Another study conducted by Nikoui et al. evaluated 58 laterally luxated permanent teeth with a follow up of 4 years. All teeth survived, but pulp necrosis developed in 40% during the first year following trauma [6].

In the present case report, a pulpal necrosis of the left central maxillary incisor was observed one week after the trauma. A root canal treatment was then indicated to prevent root resorption.

The present case also reported enamel and dentin fracture in the right central maxillary incisor without pulp involvement. The dentin was lined with calcium hydroxide. At 12 months follow-up, no clinical or radiographic signs or symptoms were reported.

A study conducted by Saad Al-Nazhan et al. in 1995, showed a 53% frequency of pulp necrosis, and 6 teeth (7%) showed external root resorption.

An explanation for the high frequency of pulp necrosis recorded after fracture could be leaving the dentin uncovered with bacteria invasion through the open dentinal tubules leading to pulp necrosis [3].

### Conclusion

A long term of clinical and radiographic follow-up is necessary for the prognosis after trauma.

The maintenance of the tooth, after traumatic injury, has a direct impact in the patient's quality of life, restoring psychological and emotional states.

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