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Intrusive luxation: Spontaneous re-eruption of permanent teeth with incomplete root formation case report

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Abstract

Intrusive luxation defined as an axial displacement of a tooth into its own socket, is one of the most severe types of dental trauma. When intrusion occurs in permanent teeth, it could potentially lead to healing complications, such as pulp necrosis, inflammatory radicular resorption, ankylosis, loss of marginal bone support, pulp canal obliteration, paralysis or disturbance of the radicular development and gingival retraction. Management is based on both clinical and radiological diagnosis.

Passive repositioning or spontaneous re-eruption is reserved to the immature teeth in first intention, however this passive method requires a regular monitoring.

The purpose of this article is to report a case of an intrusive luxation of both upper permanent immature central incisors which re-erupted within one month with a 18 month follow up.

Keywords: intrusive luxation, impaction, spontaneous re-eruption.

Introduction

Impaction or intrusive luxation is an axial displacement of tooth into the alveolar bone. This is the most severe form of tooth movement. The shock, most often axial, forces the tooth into its alveolus, causing usually a perforation of the alveolar bone^[1].

It represents between 0.3 to 1.9% of trauma affecting permanent teeth ^[2-3] and between 5 to 12% of dislocation trauma ^[4-5].

The impaction degree varies from 1 to 20 mm, most cases are between 1 and 8 mm (the totality of the crown) ^[3].

The clinical diagnosis is necessarily confirmed by retro-alveolar radiography.

The therapeutic modalities depend on the importance of dislocation and on the stage of root formation ^[6].

Case report

A 8 years old female child, accompanied by her father, consulted at the pediatric dentistry department, 14 hours following a fall on the ground (tiles) at home while playing with her sister. General examination didn't reveal any systemic disease neither any known drug allergy. Extra oral examination revealed a wound in the lower lip [Fig 1]. Intraoral examination showed the clinical absence of the two upper permanent central incisors, and a high degree mobility of the deciduous left lateral incisor [Fig 1]. Retro-alveolar radiograph showed the presence of both immature incisors into the alveolar bone with no root or alveolar fracture and the absence of any foreign bodies in the lower lip [Fig 2 a et b]. Clinical and radiological features pointed to diagnosis of intrusive luxation of both maxillary central permanent incisors and an extrusive luxation of the deciduous left lateral incisor. The management of our case consisted on saline solution mouth wash and gentle clean of the wound to remove blood clots, extraction of deciduous left lateral incisor was then performed. Medical prescription consisted on antibiotic based on amoxicillin, a first level analgesic (paracetamol) and a Chlorhexidine mouth wash. Clinical monitoring of impacted teeth objectified spontaneous eruption of the two incisors within a month [Fig 3]. X-ray was performed to assess the degree of root edification [Fig 4]. After 18 months of regular clinical and radiological follow-up, the teeth have completed their eruption with good progression of root edification [Fig 5, 6 et 7].



Fig 1: Extraoral examination: wound in the lower



Fig 6: clinical and radiological 6 months follow up

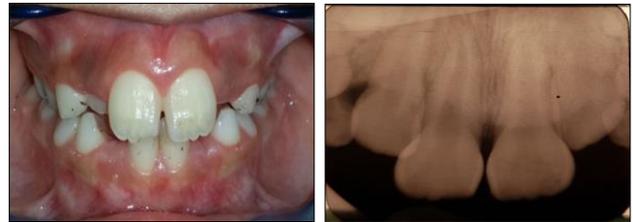


Fig 7: clinical and radiological 18 months follow up



Fig 2: x-ray examination: **A:** The absence of any foreign body **B:** The presence of both immature incisors into the alveolar bone with no root or alveolar



Fig 3: Spontaneous eruption of the two incisors within one month



Fig 4: Root edification degree: NOLLA's Stage 8



Fig 5: clinical and radiological 3 months follow up

Discussion

Intrusive luxation or impaction of permanent teeth is the most severe form of tooth movement [1].

The neurovascular system of the tooth and the periodontal ligament suffer from considerable damage. Pulp inflammation, which is frequent, generates root obliteration. The periodontal fibers are dilated and / or crushed, resulting in ankylosis or replacement resorptions. Indeed the trouble in treatment choice results in taking these two complications under consideration [7]. Luxative intrusion is difficult to diagnose, especially in mixed dentition, when differential diagnosis between intrusion and delayed eruption is hard to make. Clinical and x-ray examination should then be used to avoid iatrogenic treatment.

Clinical examination is based on a difference of height between the free edge of the traumatized tooth and the contralateral tooth, and a metallic tone to percussion. In some situations, especially for immature permanent teeth, the crown may be totally buried, which is the situation of our case report [8].

Pedodontists can also measure the impaction degree by evaluating the distance between the free edge of the impacted tooth and the adjacent tooth's marginal gingiva [3].

Radiographic examination allows to determine impaction degree, the stage of root edification, the presence of alveolar or radicular fracture as well as a possible damage of the contralateral teeth. On retro-alveolar radiographs, cemento-enamel junction's comparison, between the impacted tooth and the erupted teeth, is a good indicator of impaction degree [7]. Treatment options are related to patient's age, root development degree, and intrusion degree. These factors are also reported to be the most significant for the management outcome. The management of minor intrusive luxation of immature teeth (1- 3 mm), should be waiting for spontaneous re-eruption for a few weeks (within 3 to 4 weeks), if the tooth does not reach its physiological position, orthodontic repositioning should be initiated [9, 10].

If impaction degree is more than 7 mm (> 50% of the coronal length), the surgical or orthodontical repositioning is indicated [10]. Awaiting spontaneous re-eruption of the intruded immature permanent teeth in patients aged between 6 and 10 years, appears to be the most appropriate treatment strategy. Orthodontic or surgical repositioning are the two alternatives [11].

The benefits of surgical repositioning is rapid recovery of the original tooth position that promotes periodontal healing and

access for endodontic treatment. However, the risk of periodontal lesions can be raised because of surgical manipulation^[6].

The treatment described in the present case report is relatively simple, adopting a conservative approach which is passive repositioning or spontaneous re-eruption.

Our 8 years old patient was very anxious after her trauma. Root development degree was at stage 8 of NOLLA's classification, otherwise intrusion degree was minimal and different between the two incisors, the right incisor (11) was more impacted than the left one (21) this observation has been objectified in the x-ray examination.

All those parameters oriented our management to the waiting for spontaneous re - eruption, associated to a regular follow up that can predict any healing complications.

Each follow-up session consisted at pulpal sensibility test, percussion test and radiological examination to check the root development.

At the first month follow-up, the two incisors started their re-eruption but at different degrees, the pulpal testing was negatif in the two incisors and that was a false negatif, this situation may be seen in the first three month following the trauma and that can be explained by the pulpal sedation^[10].

At the third month of radiological examination, we suspected an interruption of the root edification between the left and the right incisor, also the pulpal testing stills negatif. The absence of obvious healing complications justified our management of this situation by waiting for the next examination.

At the sixth month follow-up, the two incisors made their full eruption, the pulpal testing became positif and the roots continues their development for both teeth.

Clinical and radiological control at 9 months was satisfying with no signs of complications.

The patient was seen again at 12 months, then at 18 months, she stills followed up in our service until complete root formation.

Conclusion

Traumatic dental injury is a dental public health problem in children. Considering the importance of dental intrusive luxation, treatment choice requires rigor to avoid any iatrogenic management.

Therapeutic decisions should be based on clinical and radiographic signs. Immature permanent teeth have a high eruption and repair potential. It is recommended to wait for spontaneous re-eruption every time that the clinical situation allowed it with monitoring.

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