

Exposure of an Impacted Canine for Orthodontic Management: A Case Report

Himani Kaushik¹, Richa Verma², Deepika Kheriwal³

¹Department of Periodontology, Postgraduate Institute of Dental Sciences, Rohtak, Haryana, India- 124001

^{2,3}Department of Pedodontics, Postgraduate Institute of Dental Sciences, Rohtak, Haryana, India- 124001

Corresponding Author: Dr. Richa Verma JR III Department of Periodontology, Postgraduate Institute of Dental Sciences, Rohtak, Haryana, India. Pincod 124001, Email – dr.cherryricha14@gmail.com

ABSTRACT

According to the epidemiological data, traumatic dental injuries are a serious public health problem and the most common injuries among children. Subluxation is defined as the loosening of a tooth without displacement. An 8-year-old girl sustained traumatic sub-luxation injuries of different types to her maxillary immature permanent incisors that were stabilized for 2 weeks and managed without endodontic intervention. Clinical and radiographic follow-up examinations were conducted at different intervals. The objective of this case report was to describe the conservative therapeutic approach to the subluxation. The teeth continued to develop and mature and were retained in a state of health and normal function.

Key words: Dental trauma, Luxation injury, Paediatric dentistry, Subluxation.

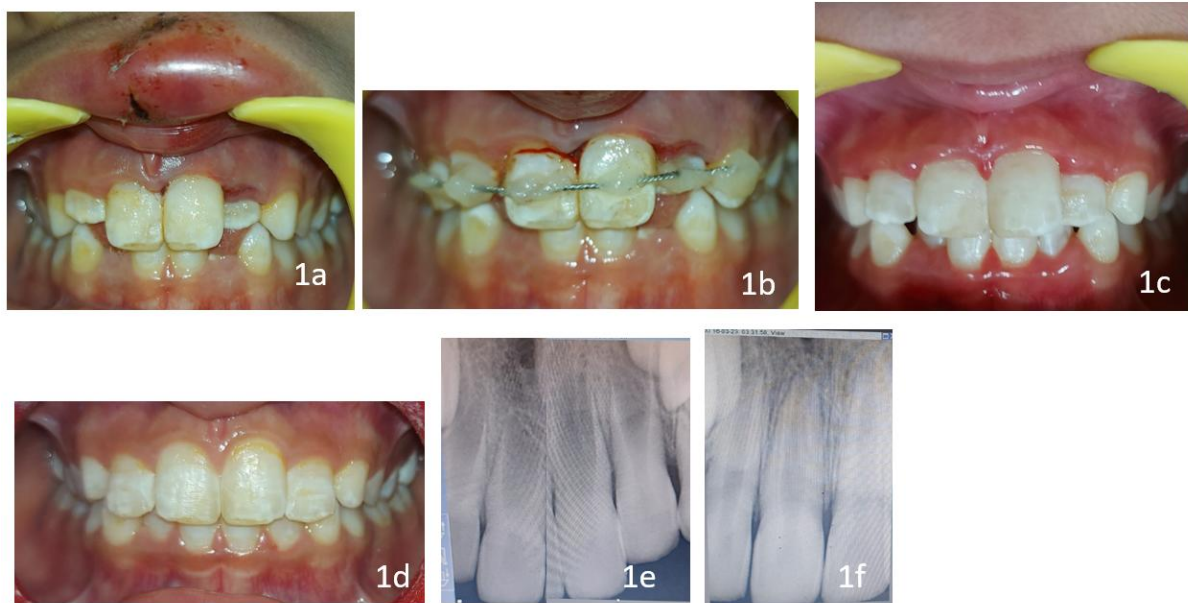
INTRODUCTION

Traumatic injuries to permanent teeth, of which approximately 55% are luxation, predominantly occur during the 10 year period of 6 to 16 years of age and overwhelmingly affect the maxillary incisors. [1] The dental pulp response to tooth luxation can have essentially three outcomes: survival, calcification or necrosis, depending upon the severity and type of injury and the stage of tooth development [2]. Pulp survival is maintained to a high degree with mild to moderate luxation injuries (concussions and subluxations), while with severe luxation injuries (extrusive, intrusive and lateral luxations) pulp necrosis is a frequent occurrence. [1] Subluxation is defined as the loosening of the tooth without displacement (3,4). The intraoral examination of the subluxated teeth may reveal increased mobility and sensitivity to percussion. Bleeding in the gingival sulcus may accompany this clinical condition. Radiological examination shows that the tooth is in its socket and in its normal position (3). In subluxated teeth, the periodontal ligament is not completely torn but the neurovascular support of the pulp is damaged. Electrical pulp testing may provide negative results until the blood perfusion to the pulp is restored (3). However, the dental pulps of severely luxated immature teeth have a much higher rate of survival than those of mature teeth. Therefore, in respect of the prognosis, colour change and the emergence of the periapical radiolucent lesions are more acceptable diagnostic criteria (3). 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 [5]. Pulp necrosis was significantly related to the size of the apical foramen, with a higher incidence of pulp necrosis occurring in teeth with a smaller apical foramen and a lower rate of pulp necrosis in teeth with a larger apical foramen.[6] Therapeutic choices in the subluxation vary from the follow-up without any invasive intervention to the tooth extraction (7).

CASE REPORT

A 8-year old girl, had presented with her mother to a dental clinic for after-hours emergency treatment of dental injuries sustained when she accidentally fell while riding a bicycle. On examination, child had sustained abrasions and contusions of her upper and the right and left maxillary central incisor had been subluxated. The abrasions and contusions of the lips were treated. subluxation injury, which was determined with the presence of the bleeding in the sulcus and sensitivity to percussion (Figure 1a). We did not observe any increase in the mobility and any other pathological finding in the radiological examination.(figure 1e) As the control, which was done with the electric pulp testing, (Parkell Gentle Pulse, Parkell Electronics, USA) showed no response. Repositioning of the teeth was done and splinted with composite bonded ligature wire placed across the anterior arch from the right to the left

deciduous canines. (Figure 1b). Soft diet was recommended and mouth hygiene instruction was provided. In the follow-up at 2 weeks splint was removed. Assessment at the end of the follow-up period at 18 months (figure 1d,f) revealed continued root growth and apical development, the absence of pulpal and periapical disease and retention of the maxillary incisors in a state of health and normal function.



1a) subluxation of 11 and 21 with abrasion and contusion on lips. 1b) after composite with braided ligature wire splinting. 1c) at 3-month follow-up. 1d) At 18-month clinical follow-up. 1e) pre-operative radiograph showing immature 11 and 21. 1f) 18 month radiographic follow-up showed continued root development without pathological change.

DISCUSSION

This was a clinical case of dental trauma in an 8-year-old girl, who sustained luxation injuries of different types to each of her immature maxillary permanent incisors. The teeth were initially repositioned and stabilized with a flexible composite bonded wire splint for 2 weeks and then minimally managed, without endodontic intervention, and continuously monitored for 18 months.

At 2 weeks after injury the findings of non-responsive pulp sensibility test results were not considered to be conclusive for developing traumatized teeth, since there can be a temporary loss of sensory nerve function which can later return to normal.[8]

Additionally, pulp vitality test results with immature teeth can be misleading because full development of the Plexus of Raschkow and full pulpal innervation with A-delta nerve fibers takes place after root formation has been completed [9].

Each of the subsequent follow-up examinations after the injury showed that the traumatized teeth continued to progress in their development without any adverse signs or symptoms of pulpal or periapical inflammatory disease, the pulps of traumatically luxated immature teeth have been shown to have a much higher rate of pulp survival and a much lower rate of pulp necrosis than mature teeth with every type of luxation injury [10].

These clinical investigations [11,12] on the outcomes of various types of luxation injuries showed that for immature permanent teeth the opportunity for pulpal and periodontal healing, continued root development and apical maturation was favourable and that the prognosis for retention without endodontic intervention was good.

Careful and continual assessment is necessary to determine the progress and prognosis of pulpal healing for traumatically luxated immature teeth. The findings of the surface resorption can be observed in the radiological examinations earliest in the 6th week (16). We did not observe any pathological finding in the follow-up controls in the 6th and 8th weeks.

REFERENCES

- [1]. Andreasen JO (1970) Etiology and pathogenesis of traumatic dental injuries. A clinical study of 1,298 cases. *Scand J Dent Res* 78: 329-342.
- [2]. Feiglin B (1996) Dental pulp response to traumatic injuries--a retrospective analysis with case reports. *Endod Dent Traumatol* 12: 1-8
- [3]. Andreasen FM, Andreasen JO. Injuries to the Primary Dentition. In: MT Flores, G. Holan, M. Borum, editors. *Textbook and color atlas of traumatic injuries to the teeth*. 4th Ed., UK, Munksgaard: Blackwell; 2007: 531-41.
- [4]. Fried I, Erickson P, Schwartz S, Keenan K. Subluxation injuries of maxillary primary anterior teeth: epidemiology and prognosis of 207 traumatized teeth. *Pediatr Dent*. 1996; 18(2): 145-51.
- [5]. Andreasen FM, Pedersen BV (1985) Prognosis of luxated permanent teeth--the development of pulp necrosis. *Endod Dent Traumatol* 1: 207-220
- [6]. Andreasen FM, Zhijie Y, Thomsen BL (1986) Relationship between pulp dimensions and development of pulp necrosis after luxation injuries in the permanent dentition. *Endod Dent Traumatol* 2: 90-98.
- [7]. Holan G. Long-term effect of different treatment modalities for traumatized primary incisors presenting dark coronal discoloration with no other signs of injury. *Dent Traumatol* 2006; 22(1): 14-7.
- [8]. Skieller V. (1960) The prognosis for young teeth loosened after mechanical trauma. *Acta Odont Scand*. 18: 171-81.
- [9]. Harris R, Griffin CJ (1968) Fine structure of nerve endings in the human dental pulp. *Arch Oral Biol* 13: 773-779
- [10]. Andreasen FM, Pedersen BV (1985) Prognosis of luxated permanent teeth--the development of pulp necrosis. *Endod Dent Traumatol* 1: 207-220.
- [11]. Wigen TI, Agnalt R, Jacobsen I (2008) Intrusive luxation of permanent incisors in Norwegians aged 6-17 years: a retrospective study of treatment and outcome. *Dent Traumatol* 24: 612-618.
- [12]. Tallingaridis G, Malmgren B, Andreasen JO, Malmgren Olle. (2012) Intrusive luxation of 60.
- [13]. Andreasen FM, Pedersen BV. Prognosis of luxated permanent teeth - the development of pulp necrosis. *Endod Dent Traumatol*. 1985; 1(6): 207-20