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Multiple dentoalveolar traumatic injury: a case report (3 years follow up)

CASE REPORT

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Abstract – Dental trauma with children and adolescents is a serious dental public health problem. Traumatic injuries on permanent teeth are common, and dramatic episodes can occur during childhood. Cases of dental avulsions and reimplantations, dentoalveolar fractures, several forms (lateral, extrusive and intrusive) of luxations, concussion, subluxation, gingival lacerations and hard, pulpal dental tissue lesions have been extensively reported. This case report presents the therapy for severe trauma caused by multiple traumatic injuries to the dentoalveolar complex of a patient.

Dentoalveolar injuries with adolescents are a challenge to a practitioner because of the dynamic state of the alveolar and dental development. Traumatic injuries occurring with dramatic episodes to permanent teeth are common during childhood. This matter has been the subject of extensive studies by several authors, and the etiology, pathogenesis and principles of treatment are well described (1–5). An accepted classification of traumatic injuries of the teeth has been established and is widely used. Cases of dental avulsions and reimplantations, dentoalveolar fractures, luxations in their several forms (lateral, extrusive and intrusive), concussion, subluxation, gingival lacerations, and hard and pulpal dental tissue lesions have been extensively reported (6). Frequencies of traumatic dental injuries in the permanent dentition with children and adolescents have been reported in different parts of the world. The incidence of permanent tooth trauma is reported between 4% and 91% (maxillary central, lateral incisors and canines) in the maxillary anterior segment, and 0.6% in the maxillary premolars (6–8). The incidence of permanent tooth trauma accounts for between 4.6% and 31% for crown fracture, 3.5% and 26% for luxation, 7.9% and 62% for displacement, 3.6% and 21% for intrusion, 5.5% for alveolar fractures, between 47% and 58% for soft tissue injury, and 4% and 22% for avulsion in all permanent tooth traumas in the literature (6–10). The dentist plays a great role in the prognosis of the traumatized tooth. The prognosis of the traumatized tooth depends on his accurate diagnosis and treatment procedures (4, 5, 11). Dental injuries result in functional, esthetic and psychological disturbances accompanied by a great concern from the child to the parents.

Severe trauma patients have always been the most complicated cases for dental rehabilitation. Cases of concomitant injuries are not commonly reported and, to our knowledge, there is no accepted term to describe the coexistence of two or more traumatic conditions of the dentoalveolar complex. A case of multiple traumas concomitant with different dental traumatic injuries is reported in this case presentation.

Case history

In December 2003, a 12- year-old girl had visited our clinic within 2 h immediately after the dental trauma with a complaint of a severe traumatic injury that occurred in her mouth because of an accident in the bathroom. After examination by a physician, she was found generally in a good condition, but in any case she was referred to a dentist trained in the management of orofacial trauma for treatment. The clinical examination of the patient had determined the crown fracture of teeth numbered 11 and 21; intrusion of teeth numbered 11, 12 and 13; displacement of teeth numbered 11, 12 and 13; nearly avulsion of tooth numbered 14 (put into the alveolar socket); concussion of tooth numbered 15; alveolar fractures of right anterior segment and injury of gingival tissue in her mouth (Figs 1–4).

Under local anesthesia, the treatment consisted of the reposition of all teeth by using forceps; and a non-rigid splint was accomplished by using Unitek twist wire (3M Unitek, Monrovia, CA, USA), acid etching, bonding agent (Prime&Bond NT; Dentsply, De Trey, Konstanz, Germany) and resin composite (Clearfil AP-X; Kuraray Co., Ltd, Osaka, Japan) to labial surfaces of teeth numbered 11, 12, 13, 14, 15, 16, 21, 22, 23 and 24. The glass ionomer cement was applied to the occlusal surface of posterior tooth for increasing the

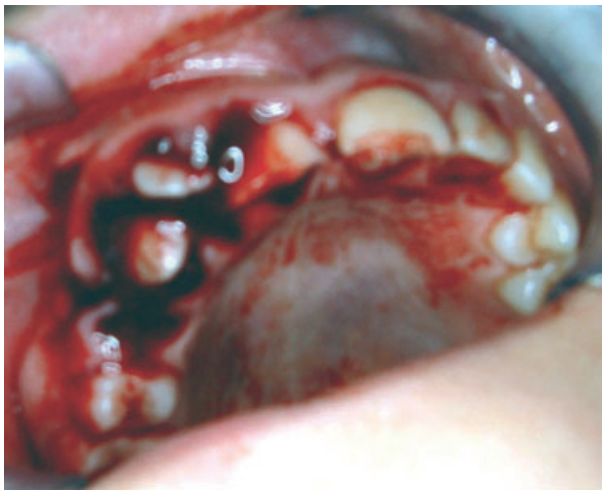

Fig. 1. Preoperative view.

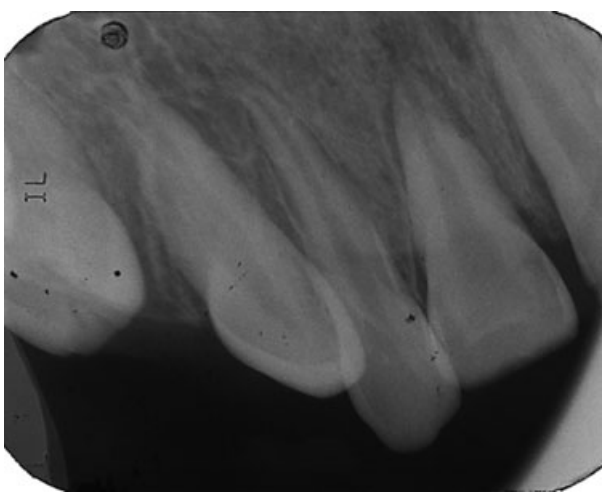

Fig. 2. Preoperative radiographic view.

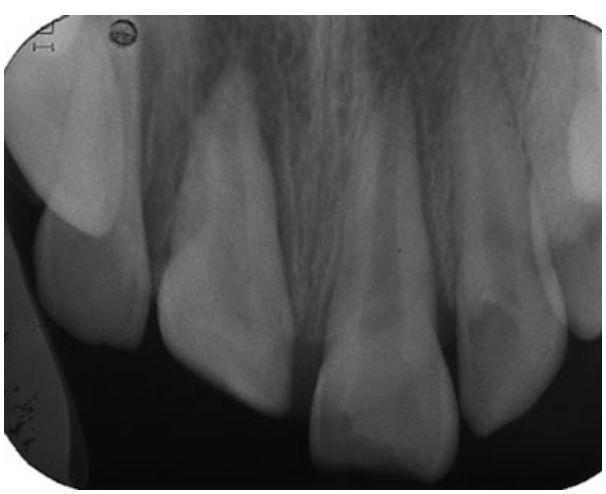

Fig. 3. Preoperative radiographic view.

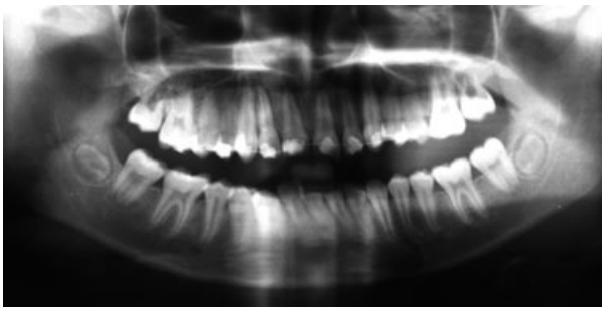

Fig. 4. Panoramic radiograph after non-rigid splint process.

Fig. 5. View 15 days later.

occlusion. The injury of gingival tissue was sutured. The patient was supported with drug therapy such as antibiotics and anti-inflammatories, and advised to use chlorhexidine twice a day for 1 week, eat a soft diet for 10–14 days and to brush teeth with a soft toothbrush after each meal. The patient was controlled 15 days later (Fig. 5). The patient recovered and was seen again in 30 days, and the non-rigid splint was removed after 4 weeks. Endodontic treatment of teeth numbered 11, 12, 13, 14 and 21 was performed with root-canal fillings by using gutta-percha points. Teeth numbered 11 and 12 were restored by a resin composite material (Figs 6–8). The patient was examined during the following 3 years (Figs 9–12).

Fig. 6. View 1 month later.

Fig. 7. Radiographic view 1 month later.

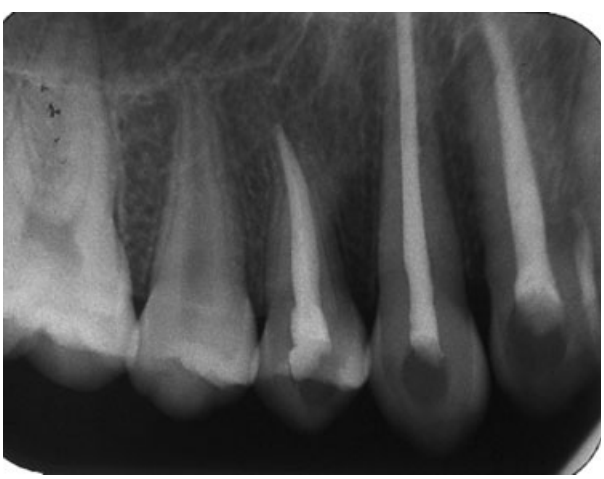

Fig. 8. Radiographic view 1 month later.

Discussion

This case report describes the management of a severe dentoalveolar trauma involving the crown fracture, intrusion, displacement, avulsion and concussion of permanent teeth, alveolar fractures and injury of gingival tissue. In this reported case, the treatment scheme was based on the guidelines suggested in the literature for the treatment of traumatic injuries.

It has been shown in earlier investigations that maxillary incisors are the teeth most often traumatized (2, 9, 10, 12, 13). Single injury was the most common type in the literature (2, 8, 13, 14). In this case, there were

Fig. 9. View 3 years later.

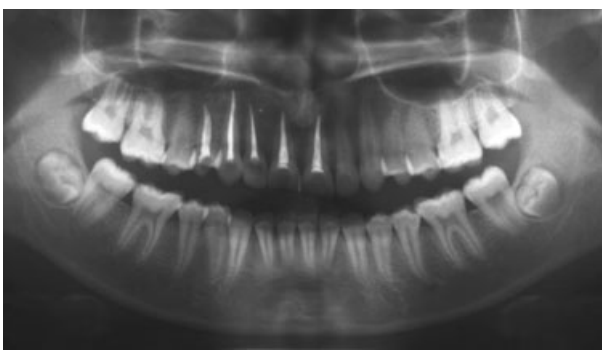

Fig. 10. Panoramic radiograph 3 years later.

both anterior segment and multiple injuries in the patient's mouth.

Acute treatment is a situation that can significantly affect the outcome within a few hours under the circumstances of tooth avulsions, alveolar fractures, extrusive and lateral luxations, and possibly root fractures. Early repositioning and stabilization will promote the best periodontal repair (4, 15). In this case, 3 years after the trauma, the teeth involved trauma had normal characteristics both radiographically and clinically. The treatment has been considered successful. This is probably because of early diagnosis of acute treatment. The acute treatment necessity after dental trauma has also been substantiated in this case. This may give the impression that all dental injuries require acute treatment.

In luxated teeth with pulp necrosis, root-canal therapy is indicated. If neglected, infection-related root resorption is a distinct and dangerous possibility. Pulp necrosis and root resorption are often seen in young patients with delayed or no treatment after dental trauma (15, 16). Therefore, to prevent root resorption, endodontic treatment of teeth numbered 11, 12, 13, 14 and 21 was performed with root-canal fillings after 4 weeks. Because all teeth involved in trauma were mobile in the alveolar socket and because of the difficulty of root-canal access in severely intruded teeth, all teeth were immediately needed to splint.

Two important aspects of dental trauma healing should be considered, namely the effect of repositioning

Fig. 11. Radiographic view 3 years later.

Fig. 12. Radiographic view 3 years later.

and splinting and, secondly, the prevention of infection. A time relation to repositioning and splinting has so far not been established experimentally for dental tissues. With respect to wound infection, it has been shown that a significant factor in controlling soft tissue infection is early antibiotic intervention (i.e. less than 3–4 h). As antibiotic treatment, apart from tooth replantation, has not been found to influence wound healing in traumatic dental injuries (17), this factor can possibly be partly disregarded in designing the treatment guidelines after dental trauma. However, in this case, as a precaution against infection, the patient was supported by antibiotic and anti-inflammatory therapy, the use of chlorhexidine.

In conclusion, acute treatment is an important situation after dental traumatic injuries, these being a common problem in children and adolescents. An educational program should be established to encourage patients, parents and medical physician to seek dental treatment immediately after traumatic injuries.

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