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# Recurrent trauma histories of two 'unlucky teeth': 42-month follow-up

## CASE REPORT

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**Abstract** – The root fractures occur relatively rarely and account for 0.5–2.5% of all dental injuries. The fracture type, severity of dislocation, mobility of fragments and diastasis have negative influence on the healing process. The aim of this study was to describe the treatment and the 42-month follow-up period of three trauma histories in a 12-year-old patient in 1 year and to emphasize the negative effects of recurrent traumas on the healing pattern and prognosis of root fractures.

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Root fractures account for only 0.5–2.5% of all dental injuries in the epidemiological studies and are thus relatively rare (1, 2). Horizontal fractures commonly occur at the anterior maxillary region and incisors with complete root formation are the most affected teeth because of the elasticity of alveolar bone cavity (3). Fractures and complete dislocations are frequently encountered in mature permanent teeth (4).

Long-term studies revealed hard- or soft-tissue healing or pulpal necrosis of coronal fragment as the general prognosis of root fractures (5). To the authors' knowledge, there are no reports in the literature about recurrent traumas and their effects on the healing procedure.

The aim of this study was to describe the treatment and follow-up period of three trauma histories in the same patient in 1 year and to emphasize the effects of recurrent traumas on the healing pattern and prognosis of root fractures.

### Case report

A 12-year-old boy fell from a bicycle on 16 March 2002. Because of pain in the maxillary anterior region and the arm, he went to the State Hospital. His broken arm was covered with plaster cast at the hospital. Three days after the accident, the patient came to the Pediatric Dentistry Department of Süleyman Demirel University, Faculty of Dentistry.

Lacerations of the lip and the buccal mucosa were the concurrent soft-tissue injuries. Intra-oral examination revealed that the maxillary left central incisor was displaced palatally and the left central incisor had mobility (Fig. 1). He had pain during occlusion and mastication because of premature contacts between the upper and lower incisors because of dislocation. It was observed that the left maxillary central incisor had no reaction and both the lower and upper incisors (except the left central incisor with root fracture) had positive reactions to the electric pulp test (EPT).

The radiographic examination showed that the central incisors had complete root formation. There was a horizontal fracture line at the apical third of the left central tooth's root. The left incisor was repositioned and a splint was applied only to the upper central incisors, with the aim of preventing mobility. As the lateral incisors had not completed their eruption in the mouth, the splint did not involve these teeth to allow their eruption (Fig. 2). Premature contacts were eliminated; soft diet and avoidance of biting with upper incisors were suggested and oral hygiene instructions were given.

#### Second trauma

The patient was re-referred to our clinic with a second trauma 3 months after the first. The radiographs showed a root fracture at the right maxillary central incisor (Fig. 3). The existing splint was not removed to avoid additional trauma. In the clinical examination, both incisors showed mobility and sensitivity to percussion. One month after the second trauma, because of gingival inflammation, pain to percussion and palpation of soft

*Fig. 1.* Occlusal radiograph of maxilla taken in 2002.

*Fig. 3.* Periapical radiograph of central teeth after the second trauma.

*Fig. 2.* Periapical radiograph of maxillary central teeth after splinting.

tissue, we decided to perform endodontic treatment of the left central incisor. The coronal fragment of the root was cleaned and filled with $Ca(OH)_2$ (Fig. 4).

In the control examination, it was observed that the lower incisors gave negative response to EPT. The splint was removed 3 months after the second trauma and the mobility was reduced.

#### Third trauma

The patient presented after a third trauma 9 months after the second. It was the third trauma happening within 1 year. In the clinical examination, increased mobility and sensitivity of the left central incisor was observed. A splint was reapplied and the left central incisor was filled with Vitapex (Neo Dental International Inc., Federal Way, WA, USA) (Fig. 5).

The splint was removed after 3 months (Fig. 6). There was neither percussion sensibility nor pain and the mobility was reduced. The lower incisors were observed to maintain their vitality. As resorption of Vitapex at the apical part of the coronal fragment was observed and there was no clinical or radiographic symptom, the endodontic treatment of left incisor was completed with gutta–percha and calcium hydroxide-containing root canal sealer (Sealapex; Kerr, Salerno, Italy), and restored with ormocer restorative material (Admira, Voco, Cuxhaven, Germany) (Figs 7 and 8). After 42 months of follow-up, the clinical and radiographical examinations showed no adverse signs or symptoms.

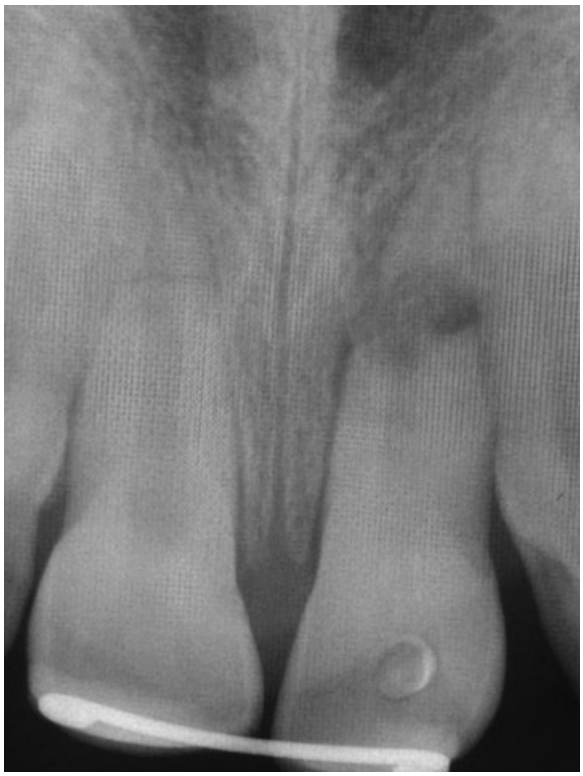

*Fig. 4*. Periapical radiograph of left central tooth after the initiation of endodontic treatment.


*Fig. 5*. Periapical radiograph taken after the third trauma.

*Fig. 6*. Control radiograph taken 12 months after the third trauma.

## Discussion

The prognosis of root fractures depends on the condition of the pulp, the dislocation of the fragments, the extent of separation of the fracture line, occlusion and the protection of teeth against multiple traumas.

The incidence of patients who had more than one trauma in southern Turkey is 5% (2). Andreasen et al. (6) has reported the incidence of patients with multiple trauma history as 7.5%.

In our case, the palatally dislocated left central tooth had repositioned in the arch after the first trauma. In the radiographic examination after the second trauma, we observed soft tissue between the fragments and obliteration of the apical part. Dislocation and diastasis was reported to have negative effects on healing (7) and the most common sequela of root fractures was pulp obliteration (8), corroborating our radiographic findings.

The lower incisors, which gave negative response to the EPT after the second trauma, maintained their vitality after 12 months. As pulpal shock may cause negative reactions to vitality tests, clinicians should not hesitate to endodontic treatment in the absence of clinical symptoms or patient's subjective complaint (9).

*Fig. 7.* Control radiograph taken 37 months after the third trauma.

*Fig. 8.* Root-canal filling of the coronal fragment with gutta–percha 39 months after the third trauma.

After the third trauma, we continued the endodontic treatment of the left central incisor with Vitapex which contains 40% iodoform and 30% $Ca(OH)_2$. In the literature, it was reported that Vitapex was successfully used in the treatment of root resorptions and fractures (10, 11).

In this case, the total fixation period was 9 months because of three traumas in a year. Andreasen et al. (7) reported that longer splinting time had no significant effect on healing and also Cvek (12) recommended that the duration of splint could be determined by considering the severity of injury and the findings in follow-up radiographs.

Control radiographs revealed calcified tissue healing and diminishing of fracture lines at the right central incisor. It is possible that a crack which occurred during the first trauma resulted in a second root fracture and by a second trauma it became visible in the radiograph. Therefore, clinicians should be careful in the radiographic evaluation of root fractures and consider multiple radiographs at various angles.

In root fractures, mobility of fragments has a negative influence on healing (6). During the healing process, repeated trauma may cause new fractures and affect the healing process and prognosis negatively. Prognosis of teeth with root fractures can be improved by accurate diagnosis, early intervention and appropriate treatment options. For hyperactive patients, protective options should be considered and their parents should be cautioned about the patients' proneness to multiple traumas.

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