Spontaneously healed root fractures: two case reports

CASE REPORT

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Horizontal root fractures have been reported to occur in less than 3% of all dental injuries. These fractures are more likely to take place in fully erupted permanent maxillary central incisors with completely formed root (1).

When a root fractures horizontally, the coronal segment is displaced to a varying degree, but generally the apical segment is not displaced. Because the apical pulpal circulation is not disrupted, there is an extremely rare occurrence of pulp necrosis in the apical segment. Pulp necrosis of the coronal segment displacement occurs in about 25% of cases (2, 3).

Horizontal root fractures most often occur in maxillary central incisors and are frequently seen in the middle-third of the root followed by apical and coronal third fractures. Fractures at the coronal third are rare and their prognosis is poorer than for a root fracture at the middle or apical third (4, 5).

Generally, fractured roots are diagnosed shortly after the injury but occasionally they are identified at subsequent routine dental examinations.

The aim of our two case reports was to show the results of two spontaneously healed root fractures.

Case report 1

A 56-year-old male was referred to the Department of Endodontics with pain of the maxillary right first premolar. Examination of full mouth radiographs revealed a horizontal root fracture in the middle third of the maxillary right central incisor (Fig. 1). The patient reported that he had been a boxer until 40 years ago, and that he had had impact trauma on his face many times. But he also reported that he had no significant complaints related to his tooth except its extrusion. Clinical examination revealed no subjective symptoms. No tenderness or pain to palpation of the soft tissues or pain to percussion, fistulae or discoloration of the coronal segment of the fractured tooth were observed. The tooth tested vital to electric pulp test and thermal tests. Radiographic evaluation revealed no periapical or periradicular pathology.

Case report 2

A 37-year-old male was referred to the Department of Endodontics with pain of the maxillary right first molar. Examination of full mouth radiographs revealed a horizontal root fracture in the cervical-third of the maxillary right central incisor (Fig. 2). The patient reported a traffic accident when he was 16 years old and experienced frontal impact. Since then no complaint relating to his teeth occurred and the patient had not been referred to the dentist.

Clinical examination revealed that the tooth was asymptomatic; there was no mobility or pain to percussion or palpation. The tooth tested vital to electric pulp stimulation and thermal tests. Radiographic examinations revealed no periradicular pathology.

Discussion

Teeth with root fractures have more possibility of maintaining a vital dental pulp than luxated teeth without fracture. When the pulp tissue's vitality preserved, the odontoblasts and cells from the cementum are usually responsible for the healing process (5).

Following a root fracture, if there is no mobility and displacement of the coronal segment, the patient may have no apparent complaint and may not require dental treatment. In one study it was reported that 31% of patients with root fractures were identified coincidentally during subsequent dental radiographic examinations (4).



Fig. 1. Periapical radiograph shows horizontal root fracture in the middle third of the maxillary right central incisor.



Fig. 2. Periapical radiograph shows horizontal root fracture in the cervical third of the maxillary right incisor.

The sequelae of root fractures may be divided into four categories: (i) healing with calcified tissue; (ii) healing with interproximal connective tissue; (iii) healing with interproximal bone and connective tissue and (iv) interproximal inflammatory tissue without healing (3, 6).

Ideally, the fragments should heal by reunion of the fragments with hard tissue. This type of healing could be achieved by splinting of the tooth as soon as possible. If the displacement of the coronal part during the accident is not severe, the chance of a better prognosis increases (1, 3, 5, 7). If the dental pulp injury is severe, healing does not occur without root canal treatment (5).

Healing of the horizontal root fractures without treatment is presented in many reports (4, 8, 9).

In our first case healing was likely with connective tissue, and in the second case with calcified tissue. Longterm follow up patients with injuries is important as pathological changes can occur several years following injury (1).

It is concluded that fractured roots can spontaneously heal provided the vitality of the pulp is preserved and displacement of fragments is prevented.

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