

Conservative Management of a Horizontal Root Fracture at Cervical Third of Root: A Case Report

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ABSTRACT

The incidence of root fracture varies from 1.2% to 7%. The prognosis and management of root fractures depend on the location of fracture. Root fractures in the apical and middle portions of the root have been associated with a better prognosis as compared to fractures in the coronal portion of the root. The present case report describes the conservative management of a horizontal root fracture. A 22-year-old male patient reported with a horizontal fracture at the cervical third of the root. Splinting with passive flexible wire for 4 months resulted in favorable healing without any need for endodontic intervention.

INTRODUCTION

Root fractures are characterized by disruption of the tooth's structural integrity, affecting the dentin, cementum, and pulp(1). Root fractures are typically categorized as either transverse (horizontal) or vertical root fractures. The incidence of root fracture ranges from 1.2% to 7.0% in the permanent dentition(2–5). Root fractures exhibit a higher prevalence in male patients, potentially linked to increased exposure to traumatic events such as automobile accidents, sports injuries, and physical altercations. Furthermore, these fractures are commonly observed in fully erupted permanent teeth with completed root development. This association may be attributed to the enhanced support provided by the surrounding bone and periodontal tissues(1).

The location of a root fracture significantly influences the treatment plan. Root fractures situated in the apical and middle thirds, along with those subcrestal in the coronal third of the root, generally require a conservative management strategy. Conversely, fractures located supracrestally in the coronal third of the root are managed differently(6). The present case study depicts the conservative management of a subcrestal horizontal root fracture at the cervical third of the root.

CASE REPORT

A 22-year-old male patient, systemically healthy, reported to the Department of Conservative Dentistry and Endodontics with a primary complaint of injury to his right maxillary incisor. Reportedly, he had suffered a fall accident two days ago. On Clinical examination there were no extraoral injuries, Intra-oral examination revealed subluxation with minimal displacement of the maxillary right lateral incisor (Figure. 1).



Fig. 1: Intraoral View Of Fractured Maxillary Right Lateral Incisor

The maxillary right lateral incisor showed grade 2 mobility. Radiographic examination revealed a cervical root fracture of the maxillary right lateral incisor, below the alveolar crest (Figure. 2).

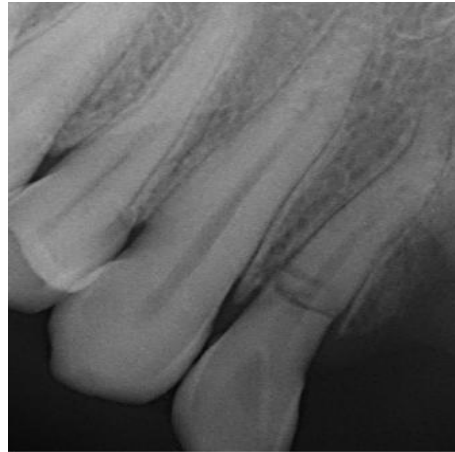


Fig. 2: Radiographic View Of Fractured Maxillary Right Lateral Incisor

The tooth was repositioned with slight finger pressure, under local anaesthesia and splinted using a flexible passive splint (0.4mm diameter round stainless steel wire) for 4months (Figure 3).



Fig.3: Passive Flexible Splint Placed For Four Months

The patient was recalled periodically for clinical and radiographic evaluation at 4 weeks,8 weeks,4 months,6 months, and 1 year (Figure 4-5).



Fig. 4: Follow Up Radiograph After 4 Months



Fig. 5: Follow Up Radiograph After 12months

The splint was removed after 4 months. On clinical examination at follow-up, the tooth was asymptomatic and responded normally to the cold and electric pulp tests. The tooth was associated with normal mobility and had no tenderness or pain on percussion. On radiographic examination, a narrow radiolucent fracture line with rounded edges was evident, suggestive of healing with interposition of connective tissue.

DISCUSSION

Horizontal root fractures result in displacement of the coronal portion whereas the apical portion usually remains displaced. This results in necrosis of the coronal fragment in 25% of cases whereas necrosis in the apical fragment is rare(7,8).In the present case study the coronal fragment was minimally displaced. Stabilization of the coronal fragment was done with a passive flexible splint for 4 months according to the IADT guidelines(9). No endodontic treatment was initiated as the cervical fractures have the potential to heal. The results of the study were in accordance with a recent study(10)that report that horizontal root fractures can achieve favorable outcomes and if treated early can reduce the need for endodontic treatment. Other factors affecting the prognosis are the degree of displacement, mobility of fragments, flexible splinting, and optimal repositioning(11,12).

In the present case study , the tooth had grade 2 mobility with minimal displacement. optimal repositioning followed by flexible splinting within 2 days of trauma was done which resulted in favorable healing at the end of one year. Four distinct types of healing responses have been identified by investigators(13):1. Healing with calcified tissue, 2. Healing mediated by connective tissue. 3. Healing mediated by both bone and connective tissue. 4. Interproximal inflammatory tissue without healing. In the present study fractured segments were separated by a narrow radiolucent line and rounding of edges was seen suggesting that healing was mediated by presence of connective tissue. The tooth responded normally to both cold and electric pulp test and patient was asymptomatic with normal mobility at follow up evaluation at 4, 6 and 12 months. A limitation of this study was shorter follow up period of 12 months whereas at least 5 years of follow-up is recommended in recent guidelines⁹ to monitor the pulp status of the tooth for any chance of developing necrosis.

CONCLUSION

Conservative management of horizontal root fracture at cervical portion of root can have favourable healing response.

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