INTRODUCTION

Root fractures result after the impingement of high force upon the root which has detrimental consequences for the cementum, dentin, pulp, and periodontium. Root fractures are relatively uncommon compared to other dental traumas. The frequency of root fractures in permanent teeth is only 0.5% to 7% out of which 68% of root fractures occur in the central incisors, 27% in lateral incisors and only 5% of root fractures are found in mandibular incisors. Most root fractures occur in the middle-third of the root followed by apical and coronal third fractures, and are also more likely to take place in fully erupted permanent teeth with closed apices in which the completely formed root is solidly supported in bone and periodontium.

Clinical management of a root fracture depends on its position and the extent of root involvement. Conservative treatment of root fractures below the alveolar crest may require reduction of the displaced fragment, immobilization and relief of the occlusion. The root fractures in the cervical one third are considered to have a poor prognosis due to a short mobile coronal fragment, with less probability of healing with hard tissue, and possible bacterial contamination of the root canal from the gingival crevice.

The following case series present a conservative treatment approach to horizontal root fractures in the cervical and middle portion of maxillary central incisors, where gutta percha filling of the root canal and splinting stabilized the root fragments.

CASE REPORT 1

A 22 year old male patient reported to the Department of Conservative Dentistry and Endodontics one week after dental trauma. The patient complained of pain in the maxillary right central incisor. The tooth was grade 2 mobile and tenderness on percussion was present. An intra-oral periapical radiograph revealed a middle third horizontal root fracture in the maxillary right central incisor.

It was decided to splint the tooth followed by endodontic treatment. The tooth 11 was disoccluded and the splinting was performed with orthodontic wire (Fig 1a). The patient was recalled after 4 weeks. At this time mobility was reduced and the symptoms had ceased.
After local anaesthesia, access cavity was made. The canal was negotiated in both the fragments. The biomechanical preparation was done and obturation of the whole root canal was done with gutta percha and sealer as a single unit (Fig 1b). The splint was removed after 8 weeks.

A review radiograph taken 3 years after the initial accident showed healing of the fracture sites in tooth # 11 with hard tissue formation (Fig 1c).

CASE REPORT 2

A 26 year old male patient reported to the Department of Conservative Dentistry and Endodontics 20 days after dental trauma. The patient complained of mobility and discomfort in the maxillary right central incisor and fracture in the maxillary left central incisor. An intra-oral periapical radiograph revealed a horizontal root fracture in the middle third of maxillary right central incisor and Ellis class II fracture in maxillary left central incisor (Fig 2a).

Splinting was performed with orthodontic wire after disoccluding 11 and the patient was recalled after 2 weeks. At this time the symptoms had ceased. The pulp sensibility tests were conducted which were negative for both the incisors. So endodontic treatment was performed for both the teeth (Fig 2b). The splint was removed after 6 weeks.

A review radiograph after 3 years showed repair with calcified tissue, giving union across the fracture (Fig 2c).

CASE REPORT 3

A 25 year-old male was referred to the Department of Conservative Dentistry and Endodontics. Patient complained of pus discharge in the upper front tooth region since 2 weeks. Patient gave history of trauma which occurred 3 years back. An intra-oral periapical radiograph was taken which revealed poorly condensed obturations in the maxillary central incisors and right lateral incisor (Fig 3a). Periapical radiolucency was observed in maxillary central incisors and widening of periodontal ligament was seen in maxillary right lateral incisor. Mid root fracture was also seen in maxillary right lateral incisor.

It was decided to perform retreatment for the same. The gutta percha was removed from the canals and biomechanical preparation was done for all the three teeth (Fig 3b). Intra canal dressing was given with calcium hydroxide and patient was recalled after 15 days. The canals of tooth 11 and 21 were obturated with gutta percha and sectional filling with gutta percha was done in 12 as it was decided to insert prefabricated post in 12 to stabilize the fractured fragments.

The patient was recalled after 1 week. Post space was prepared and prefabricated post was inserted in 12 (Fig 3c). The tooth 12 was disoccluded and splinting was then performed which was removed after 2 weeks.

A review radiograph after 3 years showed repair with hard tissue formation across the fracture (Fig 3d).

CASE REPORT 4

A 28 year-old male reported to the Department of Conservative Dentistry and Endodontics. The patient complained of pain and discomfort in maxillary right central incisor. The tooth was sensitive to percussion. Patient gave history of trauma which occurred 3 years back. An intra-oral periapical radiograph was taken which revealed a horizontal root fracture in the cervical third of maxillary right central incisor (Fig 4a). Access opening of both the incisors was already attempted by the dentist at that time. The space between the fractured segments was visible surrounding the fracture. The patient complained of pain and discomfort from the tooth. The tooth was sensitive to percussion.

After local anaesthesia, access cavity was modified for maxillary right central incisor. The canal was negotiated in both the fractured fragments and working length was taken. The biomechanical preparation of the whole root canal was done. The canal was then dried with paper points and obturated with gutta percha and sealer as a single unit.(Fig 4b, c) So both the fractured fragments were stabilized by gutta percha.

The symptoms ceased after few days and the results were satisfactory after 3 years of follow-up (Fig 4d).

DISCUSSION

Root fractures are described according to the direction of the fracture lines as horizontal root fractures or vertical root fractures. Incisors are the most frequently involved teeth with relatively few root fractures, which occur in 3% of injuries due to dental trauma.8 Horizontal-
Conservative management of horizontal root fractures
Central incisors where stabilization of fractured fragments was performed with gutta percha obturation which united the fragments whereas in case 3, prefabricated post was used to stabilize the fractured fragments. In all the cases, review radiograph showed repair with hard tissue formation across the fracture.

CONCLUSION

This article describes the successful conservative management of horizontal root fractures wherein stabilization of fractured fragments was performed with gutta percha obturation which united the fragments and improved the prognosis of the teeth.

REFERENCES


