



Conservative approach in managing traumatic injuries – a case report

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ABSTRACT	Traumatic injury of the teeth and the supporting structure can occur at any age ,it can occur due to falls, fights, sports injury or automobile accidents .the impact of trauma can be from mild enamel chipping to complete loss of the tooth due to trauma .Restoration of these fractured tooth will be acceptable with a minimal invasive procedure ,less cost and with minimum no of appointments . The present case reports the management of a tooth 11 which was intruded due to trauma , and extrusion with horizontal root fracture seen irt 21 which was managed by repositioning ,intentional replantation, immobilization of teeth and follow up of 8 months
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KEYWORDS	trauma ,horizontal root fracture ,intrusion
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INTRODUCTION:

Dental emergencies requiring prompt attention and treatment are common in dental practice. Traumatic injuries to the teeth are the most common cause for emergency treatment seen.⁽¹⁾ It occurs more frequently in younger patients due to physical altercations, accidents or injuries obtained during sports activities.⁽²⁾ This severe application of force gives rise to intrusion ,extrusion ,avulsion and horizontal root fractures, commonly in the area of the maxillary central incisors.⁽³⁾ The incidence of horizontal root fractures, compared to other dental impact injuries, is comparatively low, ranging from 0.5-7%.⁽⁴⁾ Based on the location of the horizontal root fracture, fractures in the middle-third of the root occur with higher frequency. Fractures that occur in the apical-third of the root do not show signs of displacement or mobility. Teeth with middle-third fractures are usually extruded with displacement.⁽⁵⁾ When the fracture line is above the crestal bone, there is presence of extreme mobility and dislodgement of the crown. Other signs of a horizontal root fracture include tenderness on palpation and percussion as well as transient crown discoloration.⁽⁶⁾ Adequate clinical and radiographical examinations are essential in diagnosing injuries to the teeth.⁽⁷⁾ The majority of root fractures have been shown to undergo healing. The various types of healing sequelae are 1. repair with calcified tissue; 2. repair with interproximal connective tissue; 3. repair with interproximal bone and connective tissue; 4. repair with granulation tissue.⁽⁸⁾ The last form of healing indicates the presence of pulp necrosis requiring endodontic treatment. The following case report presents a case of intrusion irt 11 and extrusion with horizontal root fracture of the permanent tooth 21 which was treated by intentional reimplantation , repositioning and fixation which healed with formation of calcified tissue.

CASE REPORT

A 37 year old female patient visited the dental speciality clinic with a complaint of pain ,bleeding and trauma to the jaws .A detailed case history was recorded and it was found that the trauma was due to road traffic accident which occurred 2hrs prior to the dental visit & tetanus toxoid injection was previously administered. On extra oral examination bleeding lips which was already sutured and the patient came to the dental clinic seeking treatment for her displaced anterior

teeth . On intraoral examination, the left maxillary central (21) was found to be extruded from the socket with a vertical split from the incisal third upto the cervical third (fig 1). The right central incisor (11) was found to be intruded into the socket. On examination of the buccal mucosa of the upper anterior teeth crepitus was found indicating a fracture of the alveolus. Radiographic examination revealed intrusion of the right central incisor into the alveolus and extrusion horizontal fracture at the middle third of the root (fig 9) .After radiographic & extraoral examination, treatment options were explained to the patient which included extraction of the teeth followed by a removable partial denture prosthesis, fixed partial denture ,and implants or repositioning of the extruded and intruded teeth with guarded prognosis after which the patient opted for the latter.

Informed consent was duly signed and obtained. Extraoral asepsis with povidine iodine was done. Local anesthetic (2% lignocaine with 1:80,000 adrenaline) was administered. Patient was asked to rinse with chlorhexidine.

The left maxillary central incisor (21) was cleaned and the bleeding was controlled. With Emdent lustra anterior forceps , the tooth was gradually repositioned in the socket. The fracture was sealed with MTA and externally flowable composite(G-aenial flow,GC CORPORATION TOKYO,JAPAN,1302181) was used to approximate the fracture (fig 6).With the help emdent anterior forceps, the right maxillary central incisor (11) was pulled from the alveolar bone in an attempt to reposition but on doing so the tooth was extruded out of the socket . The extruded tooth was placed in chlorhexidine 2%(hexidine ,JCPA health product,140076) in a wet gauze with saline in order to protect the periodontal ligament cells and then re-implanted back into the socket using the emdent extraction forceps to hold and position the tooth.The repositioned tooth was splinted using interlig glass fiber (angleus londrine ,Brasil,CA 91740) (fig 3,4&5). A coronal cap splint was prepared from the maxillary canine to canine region for extra stability of 11 and 21 using composite and it was bonded to prevent extrusion of the central incisor due to inflammatory effect and edema. The coronal cap splint was removed after two weeks following which the root canal treatment was done for tooth

11 and 21 (fig7 '8). Access opening was done followed by biomechanical preparation using protaper till ISO size 30 (Dentsply REF A 022G030)with chlorhexidine irrigation and obturated with 6% ISO size 30 protaper gutta-percha points and sealapex(Sybron endo, PART NO 18432) (fig 10) .Fiber splint was maintained. The patient was administered seratopeptidase and diclofenac sodium 2times/day for 3days and doxycycline 100mg 2times/day for 3days. Chlorhexidine mouthwash is prescribed. Patient was recalled and access restoration was done .

At the 4th week followup radiographic examination showed signs of healing at the fracture site with no clinical evidence of draining sinus or pockets. Splint was removed after 4weeks (fig 2).

At the followup of 5 month , 8 month clinically no signs and symptoms and radiograph showed a radiopaque area similar to that of bone and dentin which filled the fracture site (fig 12 and 13)

FIGURES



fig 1:traumatic injury with intrusion of tooth 11and horizontal root fracture irt 21



fig 2 post operative after conservative Extrusion of 21 management



Fig 3 :Tooth extruded from the socket



fig 4 Intruded tooth extracted For reposition



Fig 5: Tooth11 repositioned into socket



fig6 : vertical split of tooth 21



Fig 7INTERLIG Fiber Splint used





fig8 :Placement of fiber splint and cap splint



fig 9 Preoperative radiograph showing intrusion of tooth 11

fig 10 obturation done after 2 week

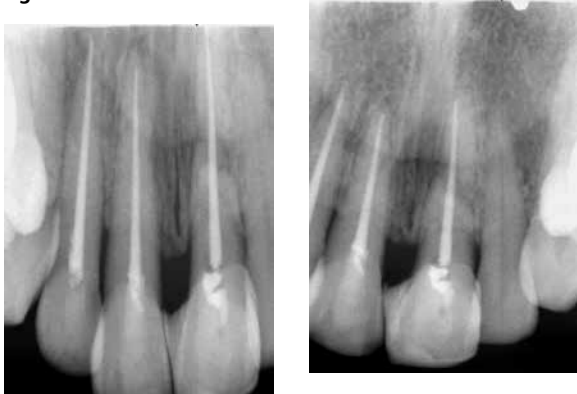


fig 11:1 month follow up

fig 12 : 5 month follow up showing fracture line in 21



Fig 13 :8 month follow up showing radiopaque area in the fracture line similar to bone and dentin

DISCUSSION

Fractures of the root dentin involve root dentin , pulp tissue and cementum. Favourable fusion of the root fragments is alleviated by vital pulp tissue and a healthy periodontium. The extent of the fracture line, the pulp tissue situation, occlusion, dislocation of fragments and the general health of the patient

determine the prognosis of the root fracture.⁹

Horizontal root fractures situated on the middle or apical third of the root present better prognosis in comparison with vertical fractures (10,11). The most common types of root fractures are in the middle third of the root (57%), followed by fracture in the apical part (34%), and in the coronal part (9%).^[12] If the fracture line is in communication with the oral cavity, the immobilization is difficult and microbial contamination of the pulp with subsequent pulpal necrosis is almost inevitable.^[13] In the present study, a fracture line at the middle third was observed at the first month follow up. Since the endodontic therapy had already been performed on the tooth, the post endodontic restoration was postponed till further follow up. In the 2nd month follow up the fracture site appeared to heal with bone like radiopacity in the fractured line.¹⁴ sealapex is a calcium hydroxide based sealer which biologically interferes the osteoclastic activity .the alkaline ph releases calcium ions important in the activation of calcium-dependant adenosine triphosphatase, cell migration and differentiation, and reaction with carbonic gas to form calcium carbonate crystals which serve as a nucleus for calcification¹⁵.

In present case, maxillary left central incisor had dislocated. Repositioning of the coronal segment of maxillary left central incisor was done with the help of emdent forceps. The splint was maintained in position for 1 month after the fracture segments approximated. The prognosis for tooth survival following a horizontal root fracture can be summarized as quite good.¹⁶In a recent study on fractures in the middle and apical parts of the root, splinting of the luxated coronal fragments and the duration of splinting were found to be of minor importance, whereas factors such as root development, pulp sensitivity and repositioning of dislocated fragments were highly predictive of the frequency.¹⁵ The treatment option of intruded teeth can be orthodontic or surgical repositioning however surgical method of management in the present case reduced the treatment time ,number of appointments and rapid access to the root canal . In the present case, 8 months after the injury, the endodontic treatment was considered successful because following signs were absent: clinical symptoms, periradicular radiographic pathology and abnormal mobility. The lamina dura of teeth 11 and 21 was intact around the tooth which shows that ther was no signs of ankylosis of the tooth with the bone.

Conclusion –

Dental injuries does not fall one group or category but with multiple categories which will have impact on the prognosis of the treatment . Current evidence helps the clinician to manage the situation to prevent the crippled and unesthetic dentition .correct treatment can change the treatment from a hopeless condition to a pleasing outcome .

REFERENCES

1. Oztan MD, Sonat B. Repair of untreated horizontal root fractures: Two case reports. *Dent Traumatol* 2001;17:240-3. | 2. Mithra N. Hegde, Shabin S : Incidence of permanent anterior tooth fracture due to trauma in South Indian Population. *Journal of Indian J. Stomatol* 2013;4(4):121-25 | 3. Caliskan MK, Pehlivan Y. Prognosis of root-fractured permanent incisors. *Journal of Endodontics and Dental Traumatology* 1996; 12: 129-136. | 4. Herweijer J, Torabinejad M, Bakland LK. Healing of horizontal root fractures. *J Endod* 1992;18:118-22. | 5. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F et al. Guidelines for fractured and luxated permanent teeth. *Dent Traumatol* 2007; 23: 66-71. | 6. Andreasen FM, Andreasen JO, Cvek M. Root fractures. In: *Textbook and Color Atlas of Traumatic Injuries to Teeth*. Andreasen FM, Andreasen JO, eds. Copenhagen: Blackwell Publishing Ltd, 2007; pp337- 371. | 7. Molina JR, Vann WF Jr, McIntyre JD, Trope M, Lee JY. Root fractures in children and adolescents: diagnostic considerations. *Dent Traumatol*. 2008;24:503-9. | 8. Andreasen JO, Hjørting-Hansen E. Intraalveolar root fractures radiographic and histologic study of 50 cases. *Oral Surg Oral Med Oral Pathol* 1967;25:414-26. | 9. Borelli P, Alibrandi P. Unusual horizontal and vertical root fractures of maxillary molars: An 11-year follow-up. *J Endod* 1999;25:136-9. | 10. Poi WR, Manfrin TM, Holland R, Sonoda CK. Repair characteristics of horizontal root fracture: a case report. *Dent Traumatol* 2002;18:98-102. | 11. Andrade ES, de Campos Sobrinho AL, Andrade MG, Matos JL. Root healing after horizontal fracture: a case report with a 13-year follow up. *Dent Traumatol* 2008;24:1-3. | 12. Gomes AP, de Araujo EA, Gonçalves SE, Kräft R. Treatment of traumatized permanent incisors with crown and root fractures: A case report. *Dent Traumatol* 2001;17:236-9. | 13. Andreasen FM, Andreasen JO, Bayer T. Prognosis of root-fractured permanent incisors – Prediction of healing modalities. *Endod Dent Traumatol* 1989;5:11-22. | 14. Lin LM, Rosenberg PA. Repair and regeneration in endodontics. *IntEndod J* 2011;44:889-906. | 15. João Eduardo GOMES-FILHO, Jaqueline Viana MOREIRA Sealability of MTA and calcium hydroxide-containing sealers. *J Appl Oral Sci* 2012;20(3):347-51 | 16. Erdemir A, Ungor M, Erdemir EO. Orthodontic movement of a horizontally fractured tooth: A case report. *Dent Traumatol* 2005;21:160-4. |