Easy, Time Tested and Unique Way of Temporary Stabilization of Teeth with Horizontal Cervical Root Fractures: Case Report

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Abstract

Horizontal root fracture in cervical third region of the tooth, presenting with pain and mobility are challenging situations for the clinicians to treat. Usually extraction is choice of treatment in cases where horizontal fractures are located more coronaldue to greater mobility and difficult stabilization all of which leading to poor prognosis. Current reportpresents with case of lower incisors with horizontal root fracture at cervical level initially advised for extraction,later stabilized with endodontic file and splinted as per the patient's refusal for extraction.Though the restored teeth presents with grade I mobility during the follow-up visits,but full filling the patients concerns for retaining her natural teeth and providing esthetic solution since last two years.

Keywords: *Horizontal Root Fracture, Endodontic File, Splinting, Endoimplant*

1. INTRODUCTION

Anterior teeth fracture due to minor trauma are commonly encountered cases in routine clinical practice. Thus successful management of such cases while maintaining form, function and aesthetics is an important aspect of clinical dentistry. Horizontal root fractures are unique cases which do not occur frequently as compared to other dental injuries and prevalence less than 3% of all dental injuries. Most commonly maxillary central incisor's are associated with horizontal root fractures due to their position in the dental arch and frequently seen in middle third of root followed by apical and cervical third[1]. Well documented literature reports states that the apical and middle fracture are comparatively easy to manage and have good prognosis when compared to that of coronal fractures,[2,3] this may be due to severe mobility of coronal fragment and excessive haemorrhage during treatment. A single fracture occurs in most of the cases and presence of multiple root fractures that too with lower incisors is a rare finding.

Current case report aims towards documentation of management of mandibular incisors with horizontal root fracture at cervical level by stabilizing fragments with endodontic instrument and splinting with semi rigid orthodontic wire using light cure composite resin. The case was indicated for extraction but due to patients concerns for retaining the natural tooth and non-compliance towards extraction the procedure was performed using simple and economic approach[4,5].

2. CASE REPORT

18 years old female patient visited to the Department of Conservative dentistry &Endodontics with chief complaint of pain and mobility of teeth in lower anterior region. She had suffered dental injury in the lower anterior arch due to minor road traffic accident 10 days back. After receiving first aid from medical practitioner she visited general dentist who attempted some treatment and advised extraction of 31 & 32.Patient was not willing for extraction thus came to our college for second opinion after 10 days. Clinical examination revealed intact crown with grade II mobility with 31 & 32.

Intra oral periapical radiograph showed two horizontal fracture lines in the cervical third root of 32 & one horizontal fracture line in the cervical third root of 31extending mesiodistally . (Figure 1)

Fig. 1 Preoperative Radiograph

Patient was not cooperative during clinical examination especially for percussion & palpation, but was very keen on saving her teeth and requested to do needful except extraction. Patient was explained about treatment plan, poor prognosis and possible longevity of both the teeth.

Following treatment options were considered and explained to the patient

-RCT & immobilization of cervical horizontal root fracture of 31 & 32 with endodontic instrument and stabilization of both 31 & 32 by splinting with 33, 34 &41,42.

-Extraction of 31 & 32 followed by fixed partial denture or implant.

-Extraction of 32 &cantilever bridge with32 & 33 or implant with 32 and immobilization and stabilization of 31.

-Patient & her guardian were not willing for extraction of 31 & 32.

As patient was not complying for the extraction, treatment plan included root canal treatment followed by the immobilization of cervical horizontal root fracture of 31 & 32 with endodontic instrument and stabilization of both 31 & 32 by semi rigid splinting involving 33, 34 & 41, 42. Due to complexity of the case rubber dam isolation was not performed. Entire endodontic therapy was performed under the local anaesthesia. Access opening was followed by radiographic working length determination. (figure.2)

Conventional biomechanical preparation of both incisors was done using 2% file of size 30 no hand files with continuous irrigation using 2% chlorhexidine and saline. Throughout the procedure fractured incisors were stabilized with light figure pressure.

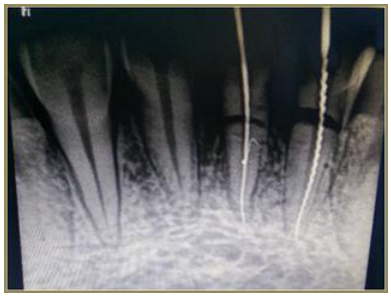

Fig.2 Working Length

Comparatively thin mix of MTA angles was filled in root canal up to fractured segment and then immediately sterile stainless steel 35 No 'H' file (Coated with MTA) was placed in prepared canal space. After taking radiographs instrument was cut at base of pulp chamber with inverted cone bur.(figure 3)

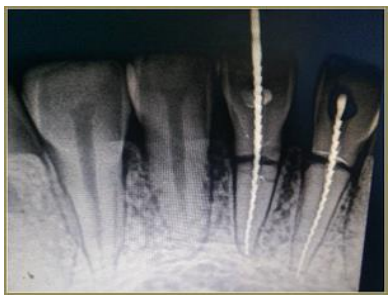

Fig. 3 Instrument in Place

Splinting of 31 & 32 labially with orthodontic wire & light cure composite resins material was done extending up to 42 mesially & 34 distally.(figure 4)

Patient was relived after sealing pulp chamber of 31 & 32 with IRM & was instructed not to chew or cut with lower anteriors. Anti-inflammatory and analgesic were prescribed.

Patient was kept at follow up visits, after four days there was slight mobility and tenderness with both 31 & 32, but pain was not present as a clinical finding. Thus post endodontic restoration was done with restorative Glass Ionomer Cement.

On two weeks recall visit both incisors were asymptomatic, but with grade I mobility was present. Thus splinting was extended for two more weeks. Patient was kept at one month recall, teeth were asymptomatic but mobility was a

constant clinical finding. Presently thirty-six months follow up is completed, patient's clinical findings indicated absence of pain was but there was no further decrease in the mobility. (figure.5, 6,7,8)

Fig. 4 Splinting

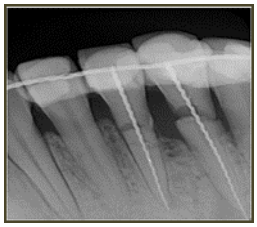

Fig. 5 After Six Months

Fig. 6 After twelve Months

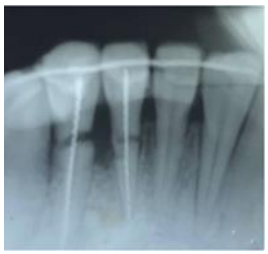

Fig. 7 After Two Years

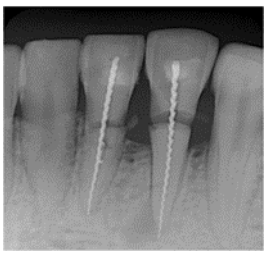

Fig. 8 After Three Years

3. DISCUSSION

The frequency of root fracture in permanent teeth is only 0. 5- 7%.4 Management of horizontal root fracture are challenging cases, But ultimate goal of preserving the natural dentition encourages the possibilities of new simple and economical technique to manage these critical situation. The classification of horizontal root fracture is based on the location of fracture line, i.e. apical, middle and coronal third of the root. Apical root fracture is asymptomatic and generally goes unnoticed. It has an excellent prognosis, because the pulp in apical segment usually remains vital and the tooth remains firm in the socket. Whereas in middle third root fracture requires immediately repositioning of displaced fragment by biocompatible material, like MTA, followed by long term application of passive splint[3]. In case of cervical root fracture the prognosis is less favourable because of the difficulty in immobilizing the tooth. Repair does not occur due to constant movement of the tooth[7]. Thus management of cervical horizontal root fracture is clinically challenging situation for an endodontist due to constant movement of coronal portion, with less probability of healing with hard tissue and possible bacterial contamination from gingival crevice. However it has also been shown that cervical fractures may heal with conservative approach and using long term splinting[8].

In current case report patient reported with pain and mobility thus immobilization of root fracture with endodontic instrument using MTA was considered safe, easy, economical and immediate treatment plan. Because of bleeding and excessive mobility of coronal segment MTA alone cannot be used as splinting material. MTA with endodontic instrument to stabilize fractured fragments was used because of its osseoinductive property, which would result in formation of hard tissue around the fractured site[9]. Beside enhancing the reduction of separated root fragment by screwing action of endodontic file, anchoring the apical fragment provided stability to coronal fragment. Such cases presents with extraction as ultimate treatment option, through clinical and radiological findings. However literature presents with some case reports on the prognosis of horizontal root fracture,[10, 11] stating that second thought can be given for retaining such teeth in dentition.

Landmark study performed by Andreason et.al, in which they studied the survival of 534 insciors after intralveolar root fracture in patients with 7-17 years of age, reported that 78% of the tooth showed healing of fracture with survival rate of 80% after 10 years. Another literature report by Cvek Mejare and Andreasen, presented with 94 cases of cervical root fractures, they observed that there was fifty percent failure rate in transverse cervical root fracture in long term. However they also mentioned that even if only half of the teeth with this type of fracture can be attempted to be saved. Therefore the conservative approach used in current case report for preservation of natural tooth in dentition and aesthetics seems to be

justified[12,13]. In this case an endodontic instrument was used to stabilize the separated root fragments. For the same reason other clinician have used metal pin or dental post which was positioned passively in the root canal together with endodontic cement[14,15]. The intersegment distance between the fragments was very less as and when patient reported for first the time, but on follow up visits patient the widening between the segments was observed with interdental bone loss and increased mobility of teeth. This presents as the reason for persistent mobility with both teeth, even after splinting for long duration of 36 month.

4. CONCLUSION

Endodontic implant is a conservative alternative that allows us to reconsider the extraction of cervical horizontal root fractured teeth cases with stability issues. Although this case is not ideal as patient reported 10 days post the dental trauma leading to increased inflammation followed by inter-dental bone resorption and mobility. Current case report focuses and emphasis on opting alternative ways for retention of tooth with cervical horizontal root fracture for improved natural aesthetics rather than losing them form dentition.

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