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A CONSERVATIVE APPROACH FOR RESTORATION OF A FRACTURED ANTERIOR TOOTH

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ABSTRACT

One of the most common form of trauma to tooth in children and adolescents is coronal fracture of anterior teeth. The most conservative and acceptable treatment in these cases is immediate fragment reattachment. By this way, original dental anatomy can be restored and it also allows rehabilitation of function and aesthetics of tooth within a very short period. For good prognosis, patient cooperation is of utmost importance. A case of coronal tooth fracture is reported that was successfully treated by tooth fragment reattachment.

KEYWORDS: Traumatic injury, coronal fracture, reattachment.

INTRODUCTION

One of the most common traumatic injuries of the tooth is complicated fracture of coronal part of tooth, and the most commonly involved teeth are maxillary incisors. The most important aspect is restoration of esthetics that is the major concern of such patients and for this reason, immediate reattachment of the fragment should be given primary consideration while deciding the treatment planning for patients with crown fracture of anterior tooth.[1] Choosing a treatment approach for a complicated crown fracture depends on the level and

position of fracture line of tooth, availability of displaced tooth fragments, type of occlusion, and prognosis.[2,3] A number of techniques have been reported for the treatment approach of fractured anterior teeth such as the use of the tooth fragment, temporary or permanent crown, and definitive crown after an orthodontic and surgical extrusion or a crown lengthening, extraction followed by implant or fixed partial denture, composite restorations, and post core supported restorations.[4] For these cases, reattachment is most conservative approach.

CASE REPORT

A 35 Year old male reported to the outpatient department, with the chief complaint of fractured upper front tooth following road traffic accident an hour ago.

On initial examination, a fracture line on the labial surface of left maxillary central incisor was evident. [Figure 1] The fractured tooth segment was mobile but attached to the tooth.

A small radiolucency near the CEJ on distal aspect of tooth was seen suspected as a small fracture line. [Figure3] Right maxillary central incisor was unaffected and completely asymptomatic. On Radiographic examination an oblique fracture was seen. After thorough clinical examination and discussion with the patient, immediate reattachment of the fractured fragment of the tooth was planned.

Local anesthesia with Lignocaine 2% and 1: 2, 00000 adrenaline infiltration was administered on buccal side of concerned tooth and incisive nerve block was given. An access opening was made on the palatal aspect, with fractured segment stabilized in position by holding with the fingers. After taking the working length [Figure4], a single visit root canal treatment was performed with sectional obturation of the canal. [Figure5] A parapost drill (3M-ESPE-USA) was used to prepare the root canal. A pre- fabricated light transmitting fiber post (Coltene Whaledent, Switzerland) was used for coronal fixation. The surface of the post space in the canal was then etched by 37%phosphoric acid and then, a dentine bonding agent was applied on both, post surface and the surface of post space and cured. [Figure6]

A flowable composite resin (Filtek Flow, 3M-ESPE-USA) was then placed into the canal and the fiber post was properly placed and cured. A small flap was raised on the distal aspect of tooth to ensure the flow of composite up to the small fracture line near the CEJ. The fractured area under the fracture line was then etched and, a dentine bonding agent was applied and cured .This area was then filled with composite resin and light cured. Then the restored

surface was finished and polished properly & flap was placed and sutured using 3-0 black silk suture. [Figure7]

IMAGES

fig 1-preoperative photograph

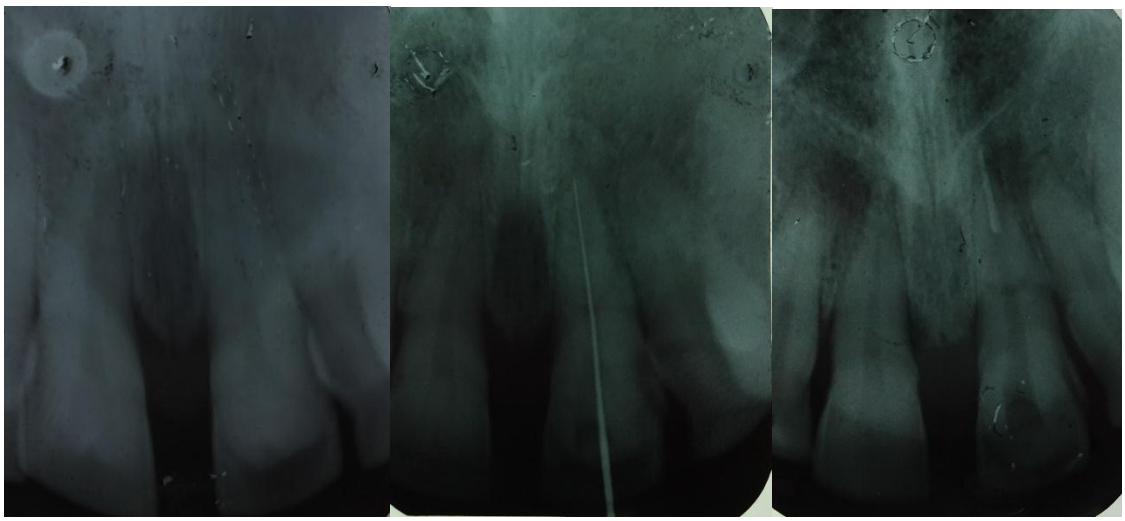

fig 2- preoperative radiograph fig 3-working length fig 4-sectional obturation

fig 5-post placement fig 6-post operative photograph

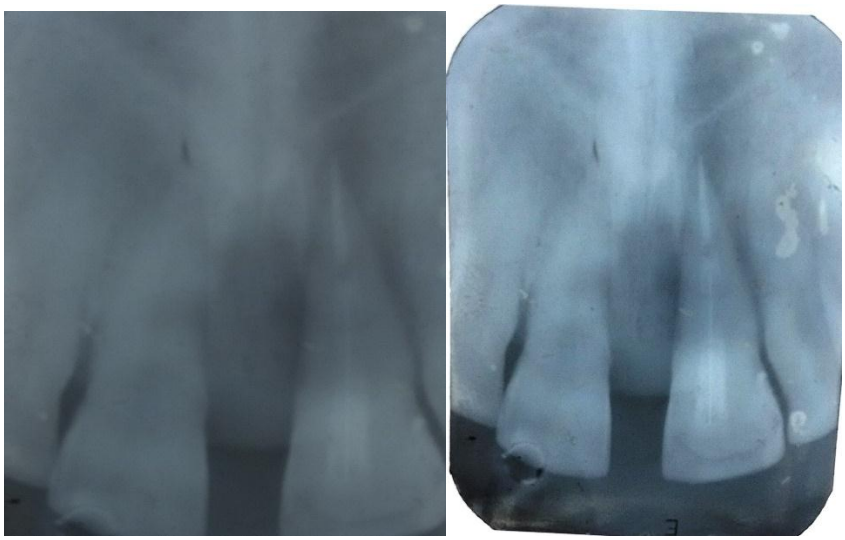

fig.7-6 months follow-up fig.8-12 months follow-up

DISCUSSION

The most conservative approach to treat traumatic injuries of tooth is reattachment of tooth fragment by the use of dental adhesive technique. Advanced systems of dentine bonding are strong enough to restore near normal masticatory efficiency of the tooth. These restorations have shown a good survival rates with less failures. The failures mostly result if the tooth is subjected to subsequent trauma.[5]

The most important factors to influence the feasibility and outcome of reattachment procedure are site and size of fracture, the health of periodontal tissues, pulpal involvement, the extent of root formation, and invasion of biological width, occlusion and the social and economic status of the patient.[6] A post reattachment is more commonly used if the fracture involves two- third or more of the crown. The coronal portion is retained via a friction bond and aid to prevent dislodgement by non- axial forces if a post is placed in addition to bonding. These fiber optic posts along with composite reinforcement technique are being widely used to enhance the esthetics and function of such teeth, which are otherwise compromised.[7] The preferred treatment modality for such teeth has been shifted from extraction to restoration with tooth strengthening by reinforcing composite and post to provide enough strength to bear masticatory stresses.

Although approximation of the fragments is affected by thickness of the cement and relocation is also difficult when using a stent that can cause incorrect placement of tooth segment, distortion of the plastic while seating and incorrect alignment of the stent. These

problems can also occur in freehand appositioning with the extra difficulty of maintaining position 3 dimensionally without movement while the cement sets.[5]

Otherwise, a fractured tooth can be treated by[5]

- Extraction of the root and its prosthetic replacement e.g. fixed, implant, removable
- Retention of the apical tooth portion and its conservation by conventional approach.eg periodontal correction if required, cast restoration.
- Orthodontic extrusion, followed by post endodontic restoration.

Fragment reattachment as a treatment option has become easier and more durable because of advancement in adhesive dentistry.[8] The advantages of this technique are restoration of enamel translucency and minimized chair side time. Post materials of various types such as carbon fiber, glass fiber etc. have recently been introduced in the field of dentistry.[9] The reattachment of fractured teeth with a fiber post has shown reduction in stress on the tooth fragment because it interlocks the two fragments.[10,11]

Most of these techniques may have their limitations that may include cost, time consuming treatment, stabilization (splinting) and their less conservative nature compared to the present case.

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