

CASE REPORT

REATTACHMENT OF FRACTURED ANTERIOR TOOTH USING AN ESTHETIC FIBER POST – A SINGLE VISIT APPROACH

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ABSTRACT:

Coronal fracture of the anterior teeth is relatively common form of dental trauma. Reattachment of a fractured fragment to the remaining tooth can provide better and long lasting esthetics, improved function, a positive psychological response and is a faster and less complicated procedure.

Key words: Esthetic Fiber Post, fractured tooth, trauma.

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INTRODUCTION

Dental trauma often has a severe impact on the social and psychological well being of a patient. Coronal fractures of the anterior teeth are a common form of dental trauma, especially affecting the maxillary incisors. Out of this, 80% are central incisors and 16% are lateral incisors. Crown and root fracture with pulpal exposure constitute 5–8% of all traumatic injuries.¹ Etiological factors of crown- root fractures are: injuries caused by fall, contact sports, automobile accidents, foreign body striking the teeth.

Factors influencing the management of crown root too fractures: extent of fracture (biological width violation, endodontic involvement, alveolar bone fracture); pattern of fracture and restorability of fractured tooth (associated root fracture); secondary trauma injuries (soft tissue status); presence/absence of fractured tooth fragment and its condition for use (fit between fragment and the remaining tooth structure); occlusion; esthetics; finances; prognosis.²

A number of techniques have been developed to restore the fractured crown. Tennery in 1988 was the first to report the re-attachment of a fractured fragment using acid-etch technique. Early techniques include stainless steel crowns,

basket crowns, orthodontic bands, pin retained resin, porcelain bonded crown and composite resin. Tooth fragment reattachment offers a conservative, esthetic, and cost effective restorative option that has been shown to be an acceptable alternative to the restoration of the fractured tooth with resin-based composite or full-coverage crown. Reattachment of a fragment to the fractured tooth can provide good and long-lasting esthetics.³

Several advantages from reattachment of fractured tooth fragment are conservation of tooth material; wear similar to adjacent and opposing tooth; color matching; preservation of incisal translucency; good esthetics; maintenance of original tooth contours; economical; preservation of occlusal contacts; color stability of enamel; delay in prosthetic restoration for young patient (eruption, margin placement etc.); positive emotional and social responses from patients.⁴

CASE REPORT

A 25yr old male patient reported to Department of Conservative Dentistry & Endodontics, Jaipur Dental College & Hospital, with pain and mobility in the upper left front tooth due to road side accident 2 days back.

Medical history was non contributory. On extra oral examination, laceration was observed on left upper lip. Clinical examination revealed horizontal fracture of maxillary left central incisor at the cervical third with exposed pulp on labial surface and palatally fracture line was not visible (fig I). The fractured tooth fragment was mobile and was attached to the soft tissues palatally. Radiographic examination confirmed the findings of clinical examination with fracture line running obliquely from labial to palatal surface. Radiographically there is complete formation of root apex, no extrusion, and absence of root or alveolar fractures. Removal of tooth fragment (fig II) and its reattachment using self etching adhesive and esthetic fiber post was planned. The treatment plan was accepted by the patient. Following local anesthesia, fractured fragment was atraumatically removed and kept in saline. Pulp tissue was extirpated. Working length was estimated using electronic apex locator (Propex, Dentsply) and confirmed radiographically. Canal was prepared using Protaper (dentsply) till F5 master apical file size and 2.5% NaOCl was used as an irrigant. Before obturation canal was irrigated with 17% EDTA and final flushing was done with saline. Obturation was done using AH Plus sealer (dentsply) and Gutta- Percha using lateral compaction technique (Fig III). Palatally, fracture line was 2mm subgingivally & above the level of alveolar crest. Gingival tissue management was done to expose the fractured line for better adaptation (Fig IV). TENAX Fiber Trans Esthetic Post (whaldent/coltene) was selected (Fig V). Post space was prepared using TENAX Fiber Trans Drill (1.1mm). Radiograph was taken for the confirmation of the post preparation (Fig. VI).



Figure I: Preoperative



Figure II: After the removal of fractured fragment



Figure III: Root canal treatment was done



Figure IV: Gingival tissue management

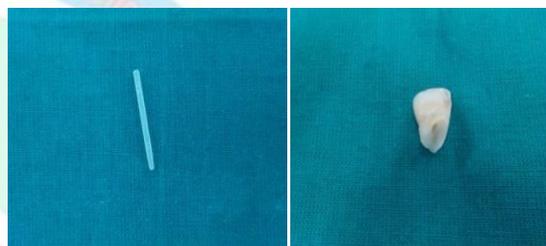


Figure V: Fibre post was selected



Figure VI: Post was luted in the canal

Before cementation, Post was wiped with alcohol. Canal was dried, and a self etching adhesive cement (Rely X U 100) was applied to the canal. Cement was coated on the post and fractured fragment. Fragment was repositioned, and cured for 2secs, excess cement was removed (Fig VII). Each surface was cured for 20secs. Labial fracture line was masked using Nano Composite (Fig VIII). The occlusion was carefully checked and adjusted, and the patient were given instructions to avoid exerting heavy function on this tooth. Patient was recalled for clinical and radiographic examinations after 1 month, 6 months and 12 months.



Figure VII: Fragment was repositioned



Figure VIII: Fracture line was restored using composite

DISCUSSION

A patient with fractured anterior teeth usually reports with pain and is emotionally upset about his or her appearance. Quick restoration of the esthetic appearance and relief of discomfort for these patients within a single appointment by preserving the natural tooth structure may lead to a positive emotional and social response from the patient. In case of complicated fractures when endodontic therapy is required, the space provided by the pulp chamber can be used as an inner reinforcement thus avoiding further preparation of fractured tooth.⁵ Resin cements are sometimes recommended to enhance the retention of posts in endodontically treated teeth. Many sealer cements used in endodontics contain eugenol, however, which has been shown to inhibit the polymerization of resins.⁶ The use of AH Plus resulted in greater retention mean value. The resin based endodontic cement allowed for greater compatibility with the adhesive system used for post cementation, as it was not always possible to remove the sealer from the canal walls.⁷ Reattachment of a dental fragment is possible due to the improvement of the adhesive technique and restorative materials. This technique can be used only when the intact tooth fragment is available. When a tooth has

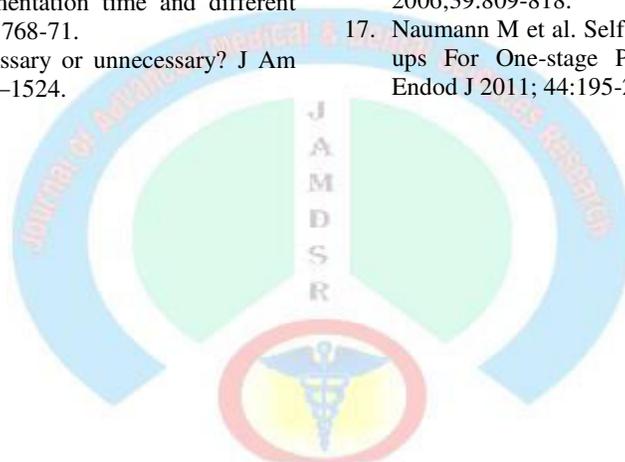
more than 50% of its coronal structure missing, the use of a post-and-core foundation is recommended prior to restoration. Posts do not strengthen endodontically treated teeth, and their use is justified only for retention of the coronal restoration.⁸ The use of post increases retention and distributes the stress along the root, with the help of the glass fiber post the fractured crown can be permanently bonded to the root. Connecting the fiber post with the resin cement increases the retention of segment and provides a monoblock effect.⁹ Most common complication in post and core system is debonding.¹⁰ Root fracture is another reason for failure of the post-and core system.¹¹ Restoration with cast metal posts can cause wedging forces coronally that may result in irreversible failure because of fracture of an already weakened root. Fiber – reinforced posts are an alternative to custom fabricated cast alloy post and core or prefabricated alloy post. They match the modulus of elasticity of sound root dentine , thus providing higher fracture resistance to weakened roots,¹² A glass fiber post was used to retain the coronal segment and reduce the stress on the luting material. The post interlocks the two separate fragments and minimizes the stress on the remaining tooth structure. With an elastic behavior more closely resembling that of dentin , fiber posts have limited the occurrence of irreparable root fractures as compared to metallic posts.¹³ Fiber post flexibility might cause stress redirection towards the post-tooth interface and thus increase the failure rate.¹⁴ Adhesive cements allow stress distribution over the entire bonded surfaces. Consequently, a post can absorb functional stresses and then direct them towards the long axis of root thus make them more favorable.¹⁵ Self adhesive cement (RelyXUnicem) demonstrated higher push out strength compared with other luting systems.¹⁶ Cement's moisture tolerance, explain its favourable adhesion in root canals. Although self adhesive cements were unable to demineralize/ dissolve smear layer completely and no evidence of a hybrid layer and resin tags were observed, good adaptation and continuity with root dentin was reported.¹¹ Self adhesive composite achieve similar load capabilities when used as a core build up material in root treated teeth restored with glass fiber posts and all- ceramic crowns.¹⁷ These options of both endodontic and restorative treatments have advantages in that they are quick and easy to perform, maintain natural tooth color, and preserve tooth structure for better retention of the reattached tooth fragments.

CONCLUSION

Tooth fragment reattachment procedure offers an ultraconservative, safe, fast and esthetically pleasing result when the fractured fragment is available. Reattaching a tooth fragment with newer adhesive materials may be successfully used to restore fractured teeth with adequate strength, but long term follow up is necessary in order to predict the durability of the tooth-adhesive-fragment complex.

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