

Natural Smile Preservation - Reattachment of Fractured Maxillary Incisor - A Case Report

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ABSTRACT

Introduction: Coronal fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents. One of the options for managing coronal tooth fractures is the reattachment of the dental fragment. Reattachment of fractured tooth fragments can provide good and long-lasting esthetics (because the tooth's original anatomic form, color, and surface texture are maintained).

Case report: A 42 year old male patient reported to the department of Conservative Dentistry and Endodontics, visnagar, having fractured anterior teeth and pain as chief complaint. Patient had a history of fall 7 day before. There was complicated crown fracture of right maxillary central incisor with no soft tissue injury or swelling.

Conclusion: Preservation of the tissue is the main moto of any treatment. This technique restores function and esthetics with a very conservative approach, and it should be considered when treating patients with coronal fractures of the anterior teeth.

Keywords: Reattachment, Fractured Tooth, Esthetics, Trauma, Maxillary Central Incisor.

CASE REPORT

A 42 year old male patient reported to the department of Conservative Dentistry and Endodontics, having fractured anterior teeth and pain as chief complaint. Patient had a history of fall 7 day before. Medical history was non-contributory. There was complicated crown fracture with right maxillary central incisor. There was no soft tissue injury or swelling. tooth was tender. On examination, the coronal fragment was attached buccally by fragile soft tissue. Clinical and radiographic examination revealed oblique fracture of maxillary right central incisor involving enamel, dentin and pulp. Fracture line was oblique running labial to palatal in an apical direction with associated pulp exposure (Ellis class 3 fracture). As the patient was mainly concerned about esthetics, immediate reattachment of fragments was planned. Fractured tooth fragment was removed first (Figure 2). The fractured fragment of crown was checked for fit with the remaining tooth structure. Root integrity was assessed with preoperative periapical radiographs. The treatment plan was decided as first to perform root canal treatment, second post space preparation, third post cementation and reattachment of the fragment. The fractured fragments were kept in 5% sodium hypochlorite for 1 minute to dissolve the remaining pulp tissue, and then placed in normal saline during the entire period before reattachment.

Single sitting endodontic treatment was performed. Post space was prepared in both the radicular portions of the tooth and the fractured crown fragment using pesso drill no 3. Appropriate-size post was cemented using rely-X™ U200 self-adhesive resin cement. (3M ESPE, Germany), (figure 3). The fractured fragments were etched with 37% phosphoric acid for 15 seconds and thoroughly rinsed with air water spray. Excess water was removed with a brief jet of air, so that the surface was left visibly wet. The bonding agent was applied to the wet dentin and enamel of the fragment. The fractured tooth was treated in similar fashion. The fragment was repositioned correctly on the fractured tooth (Figure 3 and 4). The fragment site was light polymerized on the fa-

INTRODUCTION

Webster defines esthetics as a theory "Beauty dealing with art, its creative sources, its forms and its effects." Esthetic failure is mainly because of the inaccurate, deficient communication with patient.

Trauma to the anterior teeth is common in the child and adolescent.¹ Most of the time falls, traffic accidents, violence, and sports results in the common injuries to permanent teeth. The fractured tooth can have negative functional, esthetic, and psychological effects.² In the aesthetic era, reattachment of fractured fragment should be considered first for treating the fractures of the anterior teeth. This method requires the fragment should be stored and preserved.³

Chosack and Eidelman reported the first case of reattachment of fractured incisor in 1964 in which the complicated tooth fracture was managed by endodontic therapy followed by a cast post and core. Tannery, Starkey and Simonsen reported the cases of the reattachment of fractured fragment by using the acid etch technique.¹ The success of reattachment depends upon many factors like site of the fracture, type, severity, direction of fracture line, periodontal health and pulpal status, material used for reattachment and type of post.⁴

This article reports a case of Ellis class 3 fractures in the maxillary central incisor, which was treated by reattachment of the fractured fragments using a fiber post luted by resin based cement.

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Figure-1(a,b,c): Pre-operative radiograph and pre-operative clinical photograph



Figure-2 (a,b,c): Fractured tooth fragment after removal.



Figure-3(a,b): post placement, reattachment of tooth fragment.

cial and palatal surface for 40 seconds each. Finishing and polishing of the restoration were carried out. Contact was relieved in all the protrusive, lateral movements and teeth were allowed to have protected occlusion. Post-operative instructions were given.

DISCUSSION

Trauma to the anterior teeth is aesthetically unpleasant which also affects the patient's psychological status and self-confi-

dence. Therefore, immediate treatment for the trauma to anterior teeth is required to preserve the original esthetics.

In year 1978, Tennery reported a case the acid-etch technique with a composite resin to bond tooth fragments to the remnant tooth. In 1979, Starkey reported reattachment of a tooth Fragment. In 1982, Simonsen again reported reattachment of fractured units; he used external and internal enamel bevel to improve esthetics. In 1983, McDonald and Avery described reattachment of tooth units, with no enamel preparation. They used acid etch technique to reattach the fragment.¹

In recent times of adhesive dentistry, use of the adhesive system to treat the trauma cases is considered the most conservative option. New dentine bonding systems work with such effectiveness that they allow for normal masticatory forces.³ There are many factors that are taken to consideration before deciding the treatment plan for trauma cases. These factors include the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of root formation, biological width invasion, occlusion, time and resources of the patient.⁵

Depending on these factors various treatment options are – Reattachment of fractured Fragment, Composite restoration, Orthodontic extrusion, Surgical extrusion. Crown lengthening. Followed by Post and Core supported restorations. In the pre adhesive era, fractured teeth needed to be restored either with pin retained inlays or cast restorations which sacrificed healthy tooth structure and were challenging.^{3,6} In this case, to reinforce the pulp less teeth glass fibre post was used. It has monobloc effect with no inherent weak interlayer interface helps in distribution of stresses to the remaining radicular dentin. It has less chance of microleakage and good bond strength to tooth. The apical region of the post space is far from the light; this area inhibits degree of conversion of resin cement. So In this case, self-adhesive dual cured universal resin cement (Rely X U200) was used



Figure-4(a,b): Post-operative photograph after post cementation; (c) post-operative radiograph.

to cement the post. Its use facilitated the light penetration and increased the composite resin conversion. It was white and transparent.⁷

Several advantages of fiber post for reattachment of fractured fragment are⁸ -Conservation of tooth structure, Simple procedure, Less chair time, Esthetics, Bonding to the tooth structure.

Reis and Colleagues have shown that a simple reattachment with no preparation of the fragment or tooth had less fracture resistance whereas Buccal Chamfer had more fracture resistance.⁹ Reattachment techniques are important because they are directed towards the fracture strength of the restored tooth. There are several reattachment reinforcement techniques adapted to strengthen the tooth structure like⁸ - External chamfer Circumferential bevel, Placement of internal grooves, V' shaped bevel, Superficial over contour of restorative material over the fracture line and pulp chamber, in case of complicated fracture.⁵

CONCLUSION

Restoration of the fractured tooth fragment with the most conservative treatment is utmost important because of the esthetic concerns. Reattaching the fractured tooth fragment to the tooth remnant enhances the durability of the restoration, as the fragment wears at the same rate as that of the other teeth. Also, the natural enamel translucency and surface finish of the fragment delivers the tooth with its original esthetics. The combined use of prefabricated post and the original tooth fragment is the simple, conservative approach which gives the excellent result in esthetic rehabilitation of the tooth.

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