

MANAGEMENT OF FRACTURE TOOTH FRAGMENT REATTACHMENT

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ABSTRACT:

Traumatized incisors usually fracture in an oblique fashion from labial to lingual aspect with fracture line proceeding in an oblique direction. Such cases can be managed by reattachment of fracture tooth fragment by resin cement and glass fibre post. In spite of having various treatment modalities, reattachment of same tooth fragment gives various advantages like aesthetics thereby enhancing the patient's morale and less time consuming

Key words: Reattachment, Resin cement



INTRODUCTION

Coronal fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents [1,2] The reported percentage of simple (enamel and dentin) and complex (enamel, dentin and pulp) coronal fractures in children due to trauma are 28-44% and 11-15% respectively.[3] The teeth most susceptible to fractures caused by direct trauma are the maxillary central incisors.

Traumatized incisors usually fracture in an oblique fashion from labial to lingual aspect with fracture line proceeding in an oblique direction. Management of crown fractures of the maxillary anterior teeth with regard to aesthetics is always a challenge to the clinician.[4] The traditional approach for rehabilitation of fractured anterior teeth include composite restoration, post supported prosthetic restoration and in some cases fixed prosthetics followed by extraction

If a broken fragment is available, the restoration of a tooth with its own fragment has been suggested as an alternative treatment.[5]

If a broken fragment is available, the restoration of a tooth with its own fragment has been suggested as an alternative treatment.[5] The success of re-attachment depends on the following factors such as, the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of the root formation, biological width invasion, occlusion, time material used for reattachment, use of post and prognosis.[6] recent development in restorative materials, placement technique, preparation design and adhesive protocol facilitates reattachment of fracture fragment.[7] The advantage of the alternative method includes

1. The colour and size of the original tooth can be regained
2. Has favourable wear mechanism and helps to preserve occlusal contacts.
3. The patient's psychological trauma of tooth lost can be addressed immediately, thereby enhancing the patient's morale
4. Less time-consuming, economical and conservative nature of the treatment.

CASE DETAIL:

An 18-year-old boy reported to Maratha mandal dental college, Belgaum following fracture of the crown in the right maxillary lateral incisor (Fig. 1 and 2).



Figure 1:- fracture line seen in right lateral incisor labial view



Figure 1:- fracture line seen in right lateral incisor palatal view

The trauma had occurred due to a fall about one week back in RTA injury, there was severe pain following trauma, Pain during mouth closure and bleeding from the gums at the fracture site, patient had visited to nearby local dentist and got rigid splinting with central incisors and left lateral incisor. The patient's medical history was unremarkable. No mobility of the injured tooth was recorded and there was no apparent trauma to the soft tissues in the extra oral and intra oral examination. Clinical and radiographic examination revealed that there was a oblique fracture with fracture line extending subgingivally on the palatal aspect of the right maxillary lateral incisor involving enamel and dentin with exposure of the pulp, and the fractured fragment was loosely attached to the tooth. A periapical radiograph showed that the root formation was complete with no extrusion as shown in fig 3.

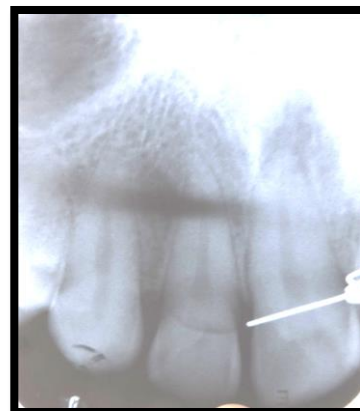


Figure 3:- intra oral radio graph showing oblique fracture line.

The patient expressed the desire to maintain the tooth and restore it due to the lower cost compared to an indirect restoration. A detailed explanation about the treatment plan was given to the patient, which included endodontic treatment, then reattachment of the tooth crown using a fibre post. The treatment plan was accepted by the patient. Local aesthetic was administered and the segment was removed (with minimal force and recovered and stored in normal saline to prevent discoloration and dehydration (Fig 4&5).



Figure 4:- after detachment of fracture fragment



Figure 5:- storage of fracture fragment in saline.

Following a detailed examination, the adaptation of the fragment was checked. The working length was determined with radiography as shown in figure 6.

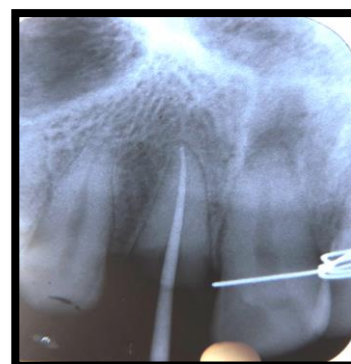
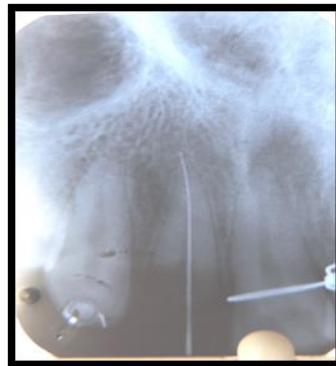


Figure 6:- IOPA showing working length determination and master cone section

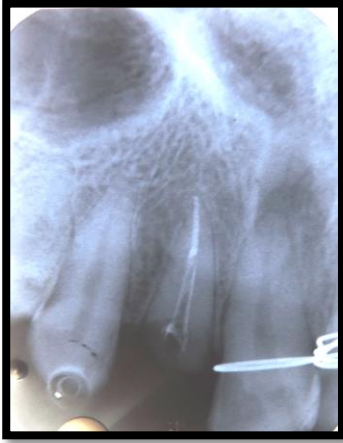


Figure 6:- IOPA showing

Gates Glidden drills were used for enlargement of coronal segment of the root canal. The root canal was enlarged to ISO size 60 at working length. 2.5% Sodium hypochlorite was used during the preparation. The root canal was dried with paper points and obturated using lateral condensation technique with gutta percha and resin sealer. . The root canal orifice was sealed with a temporary restoration.

The day after completion of the endodontic treatment, the root canal was prepared for the post placement by removing the gutta percha from the coronal two third of the canal with paeso reamers. The fibre post (FIBRAPOST, PD) was tried in the canal and adjusted to the desired length (Fig 6).

Space was also prepared in the pulp chamber of the fractured crown fragments for receiving the coronal portion of the post and also the core.



Preparation of Fracture Fragment

The alignment of the coronal fragment was verified with the post in situ. The root canal was then etched with 37%

ortho phosphoric acid, rinsed, blot dried with paper points, and bonding agent (PRIME & BOND NT Dentsply) was applied. The post was then luted in the canal using dual cured resin luting cement (RelyX 3M). The inner portion of the coronal fragment was similarly etched and bonded to the tooth using flowable composite resin (EsthetXFlow, Dentsply) after proper shade matching. The fracture line labially was then masked using composite resin (EsthetX, Dentsply). The tooth was polished with polishing disc(Fig 7).



IOPA after re attachment of fracture fragment



Clinical view after cementation

Occlusion was checked and post-operative instructions to the patient were given to deter from loading the anterior teeth. Clinical and radiographic examinations were carried out after 1 month, 3 months, 6 months and 1year and the tooth responded favourably.

DISCUSSION:

The fracture of a tooth may be the most traumatic incident for a young patient, but it has been found that there is a positive emotional and social response from the patient to the preservation of natural tooth structure.^[8]

Pioneer of this concept were Chosack and Eidelman (1964). They used post and conventional cement to reattach the anterior fracture segment in 1yr old boy.^[9]

The remarkable advancement of adhesive systems and resin composites has made reattachment of tooth fragments a procedure that is no longer a provisional restoration, but rather a restorative treatment offering a favourable prognosis. However, this technique can be used only when the intact tooth fragment is available.^[10]

Studies have indicated that dentin-bonded resin post-core restorations provide significantly less resistance to failure than cemented custom cast posts and cores.^[11,12] In addition, the fiber-

reinforced posts can be used with minimal preparation because it uses the undercuts and surface irregularities to increase the surface area for bonding. Thus, it reduces the possibility of tooth fracture during function or traumatic injury.^[13]

Hayashi et al ^[5] indicated that, the best restorative methods needed to be identified for teeth with extensive loss of structure, and reinforcing pulp less teeth.

The use of natural tooth substance clearly eliminated problems of differential wear of restorative material, unmatched shades and difficulty of contour and texture reproduction associated with other restorative techniques.^[16]

However, this technique can be used only when the intact tooth fragment is available. When an intact fragment is available, incisal edge reattachment may offer a most functional and aesthetic treatment option.^[17]

Aesthetic, biologic and restorative problems may occur as a result of the fracture extending subgingivally and

impinging on the biologic width. The treatment options depend on the relationship of the fracture to the alveolar crest, degree of pulpal involvement, amount of eruption, apex formation and aesthetic requirement of the patient. Treatment alternatives include crown lengthening to restore the biologic width, flap surgery and ostectomy/osteoplasty to restore biologic width, rapid orthodontic extrusion possibly in conjunction with fiberotomy followed by crown reattachment.^[18] In addition, tooth fragment reattachment allows restoration of the tooth with minimal sacrifice of the remaining tooth structure. Furthermore, this technique is less time-consuming, economical and provides a more predictable long-term wear than when direct composite is used.^[19]

CONCLUSION:

Though the success full outcome depends up on the various factors, Tooth fragment reattachment is non-invasive and most conservative approach. It restores shape, form, colour and aesthetics.

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