

# Esthetic management of complicated crown fracture of three permanent maxillary teeth by grout technique -A case report

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### ABSTRACT

Dental injury particularly anterior teeth trauma has severe effects on the social and mental prosperity of a patient hence requiring useful and esthetic repair at the most urgent. Customarily, fracture anterior teeth have been reestablished with composite tars; in any case, they have the essential disservice of shading bungle and variable wear. On the off chance that the tooth's fracture section is accessible and sound, reclamation of the tooth utilizing its own particular piece has likewise been recommended. Reattachment of tooth part ought to be considered and is a practical other option to customary methodologies as a result of effortlessness, unmatched characteristic style, and preservation of tooth structure. It can give great and dependable style in light of the fact that the tooth's unique anatomic shape, shading, and surface are kept up. Patient collaboration and comprehension of the restrictions of the treatment is of most extreme significance for the good result. This case report accentuation the inventive strategy of overseeing crown root break treated effectively utilizing tooth part reattachment.

**Keywords:** Fiber post, reattachment, resin cement

### Introduction

Dental fractures account for 26–76% of dental injuries in the permanent dentition.<sup>[1]</sup> Coronal breaks of permanent incisors speak to 18–22% of all injury to dental hard tissues; 28–44% being basic (enamel and dentin) and 11–15% being perplexing (enamel, dentin, and pulp).<sup>[2]</sup> Damaged front teeth require prompt practical and tasteful repair. This is especially valid if there should arise an occurrence of young patients as

it causes physiologic disability, as well as tasteful deformation prompting a mental effect.<sup>[3]</sup>

The most well-known etiological components of the crown and crown-root fracture in the perpetual dentition are wounds caused by fall (around 40%), contact sports (around 20%), car crashes, and remote body striking the teeth.<sup>[4]</sup>

Early techniques to reestablish the cracked crown included jacket crown, orthodontic band, pin retained resin, porcelain-bonded crown, and composite resin.<sup>[5]</sup> Tooth part reattachment has additionally appeared to be a satisfactory other option to

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the reclamation of the broke tooth. Tennery was the first to report the reattachment of a broke piece utilizing the acid-etch technique.<sup>[6]</sup> In this way, Starkey and Simonsen have detailed comparative cases.<sup>[7,8]</sup> Reattachment of the piece offers a few favorable circumstances like better feel and accomplishment of life-like translucency, incisal edge wear at a rate like that of the nearby teeth, substitution of broke part including less time, a positive passionate and social reaction from the patient and moderately modest strategy.<sup>[8]</sup>

Reattachment of the tooth broke at the cervical level is conceivable with the utilization of post as it interlocks the two parts and limits the weights on the reattached tooth section.<sup>[9]</sup> With the ongoing upgrades in resin-based restorative materials, tooth-shaded fiber posts alongside resin luting cement are of the decision on account of a few preferences, for example bonding to tooth structure and low modulus of flexibility like that of dentin.<sup>[10]</sup> In this report, reclamation of various broke teeth utilizing grout strategy is introduced.

## Case Report

A 54-year-old male patient reported to the outdoor patient department with the main protest of extreme torment and broke upper front teeth with the history of injury 1 day earlier. The teeth had cracked because of a bike mishap. The patient figured out how to spare the teeth pieces in water. Medical history was noncontributory. Intraoral clinical examination uncovered Ellis Class III break with 21, 22, and 23 including enamel, dentin, and pulp. The fracture lines were at the cervical level and the teeth showed no versatility. The soft tissue was just marginally harmed, while the alveolar bone stayed unaffected. Radiographically, no related root crack and no root resorption were obvious. Based on clinical examination and dental history, a finding of confounded crown crack was built up and the suggested treatment design included:

- (a) Single visit endodontic treatment with 21, 22, and 23
- (b) Fiber postcementation with dual cure resin cement
- (c) Reattachment of broke parts with dual cure resin cement

The entire strategy was disclosed to the patient, alongside every one of the advantages and dangers. At those point adjustments of the parts were checked and the fractured fragments were put away in ordinary saline. Under significant anesthesia, root canal opening was finished with a round carbide burr and pulp extirpation was finished utilizing H-file, working length was resolved to utilize Apex Locator (Root ZX, J Morita) and cleaning and molding was done using ProTaper records till F3. After proper apical gauging till no 50 measure, obturation was done using GuttaPercha and AH Plus sealer (Dentsply Caulk, Milford, DE). This was trailed by postspace arrangement utilizing peeso reamer and checking of the preassembled light transmitting fiber post (Glassix) in the canal for its legitimate length and adjustment clinically. Meanwhile, a vertical notch was made in the break pieces utilizing a decrease gap burr to suit the coronal part of fiber post and again checked for

legitimate clinical adjustment. A 37% phosphoric corrosive etchant was connected on the fiber post and afterward washed following 30 s. After total drying, adhesive (prime and bond NT, Dentsply) was connected and light-relieved. The fractured fragment and the root canal wall were also etched with phosphoric acid for 30 s and after proper drying of the canal; an adhesive was applied using a small brush, followed by light curing. The readied fiber post and cracked portions were again checked for legitimate adjustment. The post was then luted inside the trench with double fix gum concrete (Calibra, Calibra Esthetic Resin Cement, Dentsply International, Inc.) blended agreeing to the manufacturer's instructions and light relieving was finished. The overabundance concrete was expelled with a pilgrim and the tooth was cleaned with elastic glass. Intraoral impediment was checked and post agent guidelines were given to the patient. Presently, the patient is asymptomatic with attractive outcomes being recorded following 1 year development [Figures 1-3]

## Discussion

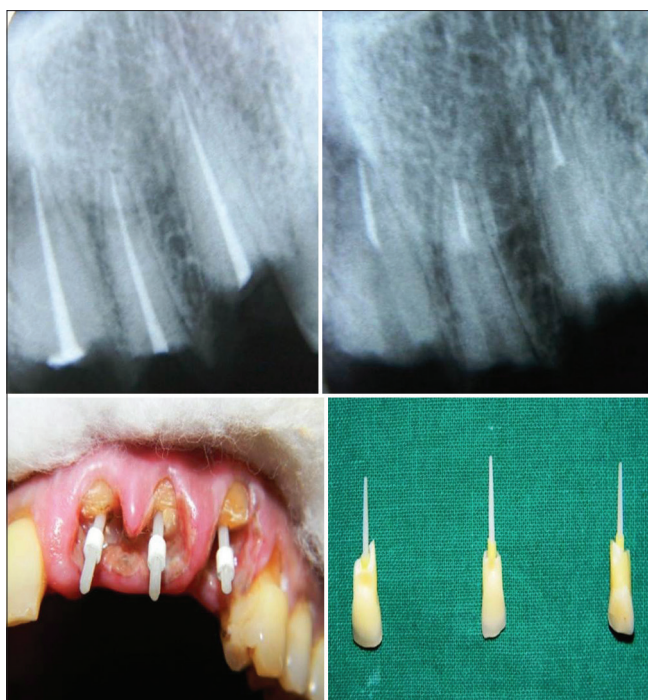
Tooth trauma by an awful episode in understanding includes a positive enthusiastic and social reaction on his part, for the safeguarding of common tooth structure.<sup>[11]</sup> Fragment's reattachment gives an ideal feel and is extremely prudent. The tooth shading, shape, and surface continue as before, being more suggested than a composite resin restoration.<sup>[12]</sup>

Different treatment alternatives have been specified in the literature for the cracked crown, for example,<sup>[13,14]</sup>

- (a) Fragment expulsion took after by restoration
- (b) Fragment reattachment



**Figure 1:** Preoperative clinical and radiographic view



**Figure 2:** Intraoperative clinical and radiographic view

- (c) Gingivectomy and osteotomy (crown lengthening)
- (d) Orthodontic expulsion with/without gingivoplasty
- (e) Forced surgical expulsion
- (f) Vital root submergence
- (g) Extraction followed by surgical implants or fixed partial denture.

An appropriate treatment choice for the cracked tooth should first think about the area of break line. In the event that the crack line is in the center or incisal third of the crown and the patient cannot recover the broke fragment, a resin composite rebuilding is favored for the two esthetic and functioning.<sup>[15]</sup>

A few agent strategies have been recommended in literature, beginning from no extra tooth readiness to different arrangement alternatives, for example, circumferential bevel, internal groove, external chamfer, and superficial overcontour of composite on the fracture.<sup>[16]</sup> Worthington *et al.* (1999) demonstrated that arrangement of any sort of readiness did not enhance crack quality,<sup>[17]</sup> while Reis *et al.* (2002) expressed that the buccal chamfer procedure gives a superior crack opposition than straightforward reattachment, both remaining nevertheless inferior to a resin composite restoration of the original tooth.<sup>[18]</sup>

Kanca J. (1996) distributed the primary case investigate the reattachment of cracked incisor fragment in which complicated tooth fracture was overseen by endodontic treatment, taken after by a cast post and center.<sup>[19]</sup> For this situation, glass fiber post was utilized alongside dual cure resin cement tooth-shaded fiber posts have a few focal points; they are more tasteful, tie to tooth tissue, their modulus of versatility is like that of dentin and fewer odds of crack may happen.<sup>[20]</sup> Utilizing glass fiber post with composite



**Figure 3:** Postoperative clinical view

core and applying the ongoing advances in adhesive methods and materials, one can make a Monobloc, a multilayered structure with no inalienable feeble interlayer interfaces.<sup>[21]</sup> Moreover, the present position serves on hold the coronal portion via friction bond, avoiding dislodgement of the nonaxial forces.<sup>[22-26]</sup>

Our case report is important to primary care as injury to anterior teeth in young/adult population is quite common and most of them reports to primary health care treatment centers where through this grout's technique fractured teeth can be preserved and reattached by dentist. Also, patients can be educated about preventive measures regarding this type of dental injury.

## Conclusion

Trauma to an oral structure like teeth represents an extraordinary mental effect on the brain of patients; therefore, it is the obligation of the clinician to decide on such a treatment methodology which will be less horrible in an officially existing awful circumstance, financially savvy, and simple to perform. Fracture reattachment with grout strategy is an extremely traditionalist treatment choice that permits functional and aesthetic restoration of characteristic teeth.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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