



# Reattachment of Anterior Fractured Tooth Fragment

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## ABSTRACT

**Introduction:** Fractures of anterior tooth can sufficiently compromise the esthetics and functionality of the tooth and hinders future treatment plans. As such, treatment without delay is always desired by the patients. The prognosis of the tooth is crucial for the success of the treatment. A conservative and an optimal treatment modality which is preferred by clinicians is reattachment of the fractured segment to its primary site.

**Case Report:** A 24-year-old male patient reported to our department with the chief complaint of broken tooth in the upper front tooth region. Considering the degree of fracture, the biological and esthetic aspects, we planned reattachment w.r.t 21,22. Root canal therapy and glass fibre reinforced composite post was planned followed by crown lengthening and reattachment of both the teeth.

**Results:** The patient was followed up for one year and showed satisfactory results.

**Conclusion:** This report highlights a case of coronal tooth fracture of a 24-year-old male that was effectively managed by tooth fragment reattachment procedure.

**Key Words:** Reattachment of tooth fragment, Dental trauma, Fracture line, Glass-fibre-reinforced composite post, Esthetics, prognosis

## INTRODUCTION

Anterior crown fractures are common dental injury frequently found in the maxillary anterior teeth of children and adolescents.<sup>1</sup> Due to the strategic location of the maxillary incisors, they are more prone to succumb to injuries than mandibular teeth.<sup>2</sup> Besides compromising the esthetics and functionality, the problem can considerably have an impact on the psychology and phonetics of the patient. Hence, for such problems, chalking the treatment plan promptly and restoring the tooth by natural means is preferred.

Factors that should be considered while managing a case of dental trauma in the coronal segment are:<sup>3</sup>

- degree of fracture (root maturation, pulpal considerations, state of bone surrounding the tooth).
- Form of trauma and restorability of dislodged segment.
- The condition of soft tissue, biological width consideration and periodontal status.

- Availability of fractured tooth piece and its status.
- Prognosis of fractured tooth, occlusion and aesthetics.

There are numerous approaches for the management of anterior tooth fracture depending on the extent of fracture and degree of mobility like resin sealing, selective grinding, splinting pulp capping, partial pulpectomy and root canal therapies. Reattachment of the broken segment is one such option when the broken segment is brought to dentist. This offers an esthetically pleasing and cheaper restorative choice and has demonstrated to be a satisfactory substitute to the fractured area restoration with composite resin or crown.<sup>4</sup>

Reattachment of the fractured segment is a simple, non-complex procedure and displays excellent and long-established esthetics (as the previous morphology of the tooth and structure are restored, hue and texture are undisturbed), reestablish the function and can have an optimistic psychological impact. Besides, tooth reattachment permits restoration with preservation of the residual tooth architecture. Fibre-reinforced post increases the resistance of the tooth to root

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 12.05.2023

Revised: 29.05.2023

Accepted: 13.06.2023

Published: 30.06.2023

fractures due to combination of adhesive and elastic features. Moreover, this procedure is of shorter duration with more predictable outcome.<sup>5,6</sup> Clinical studies with follow-ups have exhibited that therapies with restorative components like adhesive or bonding agents may aid in achieving esthetics, mechanical and functional success.

This case report presents a conservative treatment approach of tooth fracture of a maxillary anterior teeth using glass-fibre-reinforced composite post, which helped in attaining functional and aesthetically pleasing result.

## CASE REPORT

A 24-year-old male patient reported to our department with the chief complaint of pain and broken teeth in the upper left front tooth region for 3 days. The patient presented a history of road traffic accident 3 days back.

Clinical examination exposed a fracture in tooth 21,22 which was complex. The fracture line followed a slanting course from cervical portion labially to deeper subgingival region palatally. The fractured crown pieces were snugly attached to the respective teeth. (Figure 1). No other injury was detected in surrounding tissues (soft tissues or surrounding bone). Intra-oral periapical radiograph (IOPAR) displayed fracture line that followed an oblique course in the gingival third of the crown of the tooth. The radiograph did not reveal any periapical radiolucency and complete root formation with closed apex was appreciated.

Under local anesthesia the detachment of the fractured part was carried out judiciously. (Figure 2). The pulp chamber of the fractured section was cleaned and the segment was preserved in distilled water. (Figure 3).

Working length was established and cleaning and shaping of the canal was performed. This was followed by obturation by adopting lateral condensation technique. The sealer used was AH plus which shows improved results like better sealing property and reduced discoloration.

The fracture line was oblique and at the cervical third, it extended below the level of gingiva palatally. As there was time restraint by patient, crown lengthening was performed by laser on the palatal aspect that aided in visualization, hemostasis and precise fit of the fragment. The gutta-percha was then partially removed, leaving the apical 4mm of the filling to maintain a good seal and a glass-fibre-reinforced root canal post was placed in the canal. (Figure 4, Figure 5, Figure 6).

Access cavity preparation was done at the midpoint of the broken portion of the tooth which was triangular in shape. The unbroken coronal portion of the tooth and the original crown segment were etched with 37% phosphoric acid gel for 20 seconds, rinsed for 20 seconds and dried.

The tooth was then attached with flowable composite by polymerizing it for 40 seconds.

A good postoperative radiographic view demonstrated good cementation of post as well as fragment. (Figure: 7). The occlusion was analyzed. Postoperative instructions were given to the patient. The wound healing was found to be satisfactory. The patient was followed up for one year.

## DISCUSSION

Functional, mechanical and esthetics are significant determinants while restoring fractured anterior teeth. If the fractured segment is recovered and is undamaged or intact, then reattachment procedure is a convenient therapy. Hence, it is a suitable alternative therapeutic choice for prosthetic treatment.<sup>7</sup>

With the progress in dental bonding equipment, excellent results can be fetched with reattachment of the dislocated tooth remains of the biologic factors, materials, and methods are rationally judged and managed.<sup>8</sup> Natural tooth matter in restorative dentistry clearly eliminates the hindrances such as discrepancy in the wear of restorative material, mismatched shades, and complexity in contour and texture reproduction associated with other approaches. Treatment plan can be framed after judicious assessment of the occlusal and coronal relations, endodontic factors and periodontal conditions. Additional determinants that might have an impact on the choice of the technique encompass the requirement for endodontic treatment, fracture pattern and degree and the extent of approximation between the fragments.<sup>9</sup>

Fruitful reattachment is influenced by the quick retrieval of the fracture pieces stored in physiologic solution or saline to shun dehydration and subsequent change in the colour. Also, proper oral hygiene maintenance and plaque control would result in minimal invasion of biological width which in turn increases the success rate of the therapy. In the present report, the fractured portion was preserved in normal saline until the treatment, and no change in colour was appreciated during the follow-up period.<sup>10</sup>

In the present report, glass fibre post was employed to support the teeth without pulp. Its monoblock effect with no intrinsic frail interlayer interface assists in distribution of stresses to the residual radicular dentin and also there is minimal chance of microleakage with good bond strength to tooth.

The extent of retention of fiber posts in root relies on several factors like the degree of conversion of the resin cement, which may be inhibited in the most apical regions of post space, because these areas are far from the light. Thus, the exclusive use of dual cure or self-curing composites to lute fiber post is suggested. In the present report, self-adhesive dual cured universal resin cement (Maxcem Elite) was used

to cement the post, which was white and transparent. By this material we achieved good light penetration with faster composite conversion. This treatment consumes less time and requires minimum patient co-operation. There were no complications appreciated in the one-year follow-up period. Longer follow up durations and studies with larger sample size are needed to validate the effectiveness of the technique.

## CONCLUSION

This case emphasizes on the significance of reattachment of anterior tooth after pulp exposure. It is the best treatment consideration for patients who are young. However, for the success of the therapy, several factors like prognosis of the involved tooth, the status of surrounding tissues and the stability needs to be considered

## ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed

**Source of funding:** Nil

**Conflict of Interest:** Nil

**Authors' Contribution:**

Dr. Kapilesh Singh: treatment plan, endodontic therapy, supervision of the patient

Dr. Moitri Ojha: treatment plan, periodontal therapy

DR. MOHD AYAZ MALIK: treatment plan, endodontic therapy

Dr. Amit Bolival: manuscript drafting, commentary and revision

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**Figure 1:** Pre- treatment.



**Figure 2:** Removal of fractured portion.



**Figure 3:** Preserving the fractured portion in saline.



**Figure 6:** IOPAR of post and core.



**Figure 4:** Glass fiber reinforced post.



**Figure 7:** Post-treatment.



**Figure 5:** Crown lengthening.