



## AESTHETICS WITH NATURAL TOOTH VENEER: A CASE REPORT

## Endodontics

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## ABSTRACT

Among the various treatment options, reattachment of a crown fragment is a conservative treatment that can be considered for crown fractures of anterior teeth. The procedure is simple, economic, conserves tooth structure and needs less chair-side time as compared to conventional methods. This procedure is an interim type of treatment for immediate restoration of aesthetics till a more permanent treatment is planned. Advantages of the fragment reattachment is that all the alternative methods such as direct adhesive resin reconstruction, veneers and crowns can be performed in case of failure. This clinical case report describes the management of a permanent maxillary central incisor which had undergone partial crown fracture during endodontic treatment.

## KEYWORDS

natural veneer, tooth fragment reattachment, esthetics

## INTRODUCTION:

Endodontically treated teeth are susceptible to fracture due to caries or the subsequent restorative procedure, dehydration and loss of dentin after the endodontic procedures leading to weakening of tooth structure.<sup>[1]</sup> Several factors influence the management of coronal tooth fractures, including extent of fracture, biological width violation, Endodontic involvement, pattern of fracture and restorability of fractured tooth, availability of fractured tooth fragment to enable reattachment, occlusion, aesthetics, finances and prognosis.<sup>[2]</sup> Fragment reattachment requires minimal tooth preparation, provides immediate aesthetics and psychological benefit to the patient that his own tooth has been retained.<sup>[3]</sup> This case report describes the reattachment of a labially fragmented maxillary central incisor (11) which had fractured during endodontic treatment.

## Case Report:

A 65 year old male patient reported with a chief complaint of pain in upper front region of the jaw. Right permanent maxillary central incisor (Tooth no.11) was found to be tender on percussion. Patient gave a history of trauma in the past. Pulp vitality results showed no response with tooth 11 while 21, 12 responded normally. Gingival sulcus probing depth was within normal limits. Medical history was nonsignificant. Radiographic examination of tooth no. 11 (Fig no.1a) revealed a well defined circumscribed radiolucency at the apex with widening of periodontal ligament space along the root. A diagnosis of pulpal necrosis with symptomatic periapical periodontitis in relation to tooth 11 was arrived. After obtaining patient consent for root canal treatment (RCT), access opening was made in 11 under rubber dam (Hygienic, Coltene Inc, USA) isolation. Working length was determined (Fig no.1 b) and canal was medicated with calcium hydroxide (Deepti, Ratnagiri) mixed with saline paste and temporized with zinc oxide eugenol (Prime Dental Products Pvt Ltd, Bhiwandi). In the following appointment, the patient reported with fracture in 11, which he informed to have occurred during mastication. The labial half of the tooth had separated from the palatal tooth structure at the cervical aspect. The fractured margins were observed to be equigingival (Fig no. 2, Fig no. 3). Treatment options given to the patient were completion of root canal treatment of the remaining tooth structure (RTS) followed by placement of post and reattachment of tooth fragment; root canal treatment followed by cast post and full coverage crown to be placed or extraction followed by prosthesis. The patient opted for RCT followed by reattachment of the tooth fragment with a post. The fragment was stored in distilled water until the endodontic treatment was completed. The remaining tooth structure was then evaluated for any concomitant vertical root fracture the canal.

Further, cleaning and shaping was done using hybrid technique with size no.60 k file. The apical constriction was lost, hence a 5mm plug of MTA (Proroot, root repair material, Dentsply, Canada) was placed apically and temporized (fig no 1c). After 24 hours, a metal post (I post #3Prime dental products, Thane) was cemented using dual cure resin cement (Panavia F 2.0, Kuraray America, Inc) following the manufacturer's instructions.(Fig no.1d)

## Fragment reattachment:

The fractured tooth fragment was checked for the adaptation and a housing was created in the pulp chamber to accommodate the post (Fig no.4). Alignment of the RTS and crown fragment was ascertained clinically and radiographically. After Gingival retraction the tooth fragment was luted with Panavia F 2.0. The tooth fragment was adapted over the RTS and firm pressure was applied. Excess cement was removed by passing a dental floss interdentially. The dual cure resin cement was cured for 20 seconds and occlusion was reevaluated after cementation (Fig no.5). Excess cement was removed, finishing and polishing of the buccal and palatal surfaces were done with Soflex tips (3M ESPE, St Paul, MN, USA) (Fig no. 5). Patient was instructed not to bite with his anterior teeth and recalled for clinical, radiographic, and periodontal examinations in order to ensure the integrity, the esthetics, and the functional health of the fractured element (Fig no.6)

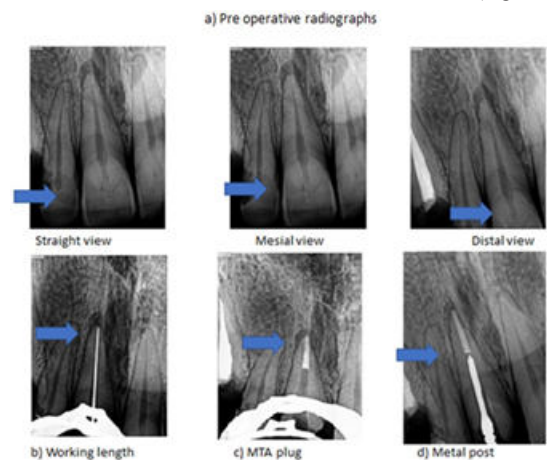
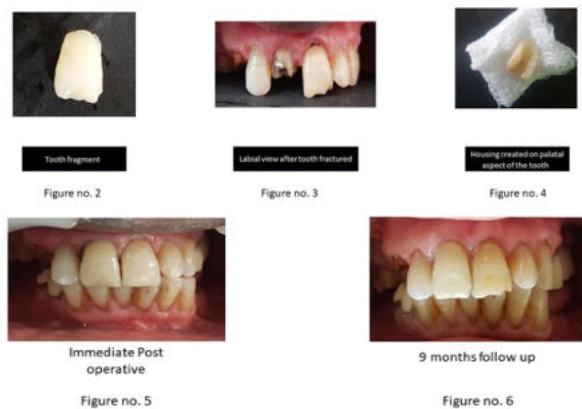


Figure no. 1



## DISCUSSION:

Dentin of endodontically treated teeth has been shown to exhibit significantly lower shear strength and toughness when compared with vital dentin and fractures on application of lesser forces because of potentially weaker collagen intermolecular cross-links.<sup>[4]</sup> The tooth in present case had undergone fracture where the labial half of the coronal aspect had split away from the palatal aspect resembling a veneer. As the fragment was equigingival and adapting well to the remaining palatal part, reattachment was considered. Enmasse crown fractures create esthetic problems for patients. Tooth fragment reattachment is an interim measure to take care of esthetic concerns till a more definitive treatment is planned. Fragment reattachment is indicated where orthodontic extrusion of fractured tooth segment may be planned to obtain a ferrule effect if fracture line extended subgingivally followed by post placement with full coverage crown with optimally intact tooth margins.<sup>[5]</sup> In order to prevent dehydration, the fragment is generally stored in a moist environment which would provide better bond strength and prevent discoloration. In this case the fragment was stored in distilled water. Different storage media like saliva, water, normal saline, hypotonic (distilled water), isotonic (milk and egg white) and hypertonic (50% dextrose) media can be used to store fractured parts of teeth.<sup>[6,7]</sup> In the case presented, after confirming the adaptation of the fragment and proximity of the margins, the fragment was retained through hybridization of the dental tissue achieved through the dual cure adhesive cement. Dual cure resin cement are capable of reaching a high degree of conversion, in either the presence or the absence of light. Nevertheless, some dual-cure resin cements are primarily dependent on light-activation, so an inadequate degree of conversion is expected when light from the curing unit is not available. Fragment reattachment procedures vary in literature. Some advocate an additional preparation of remaining tooth structure by placing a bevel or a chamfer to improve the resistance to fracture following the reattachment. Besides, the use of the simple bond without any type of preparation or the placement of a chamfer, showed a resistance equal to 37% and to 70%, respectively.<sup>[8,9]</sup> Mendes et al in 2017 reported 10-year follow-up data of fragment reattachment to the maxillary central incisor which required functional and esthetic corrections for predictable outcome.<sup>[10]</sup> The causes of failure of fragment reattachment is multifactorial. It can occur due to occlusal disharmony, trauma from occlusion, parafunctional habits like bruxism and clenching, adhesive (surface of the tooth i.e., enamel, dentin and the cement interface) and cohesive failure (cement interface), debonding of fragment due to heavy masticatory load. In spite of limitations in the reattachment technique, it renders a conservative and economical interim treatment, maintaining the psychological impact until a definitive treatment is planned especially in the anterior teeth region.

## CONCLUSION:

Fragment reattachment treatment is immediate, uses adhesive materials, eliminates the need for invasive and complex restorations and acts as an interim restoration till a more definitive treatment is planned. Essential advantage of the reattached teeth is that alternative methods such as direct adhesive resin reconstruction, veneers and crowns can be performed in the event of failure.

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