



### RESEARCH ARTICLE

## IMMEDIATE ESTHETIC REHABILITATION OF FRACTURED ANTERIOR TEETH: A CASE REPORT

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### Abstract

Traumatic dental injuries (TDIs) account for 5% of all injuries and are more common in young patients. Such injuries require immediate attention and solution to prevent the devastating psychological impact on patient. Adhesive reattachment requires minimum healthy tooth reduction and has a predictable esthetic result. It is usually faster than a complete composite restoration, plus patient also feels relief by keeping one's own natural tooth. Here we report 2 such cases with 6 months follow up, where reattachment with Super Bond was considered and was successful.

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### Introduction:-

Traumatic dental injuries (TDIs) occur frequently in children and young adults, comprising 5% of all injuries.<sup>3</sup> The majority of dental injuries involves the anterior teeth, especially the maxillary incisors. These injuries usually affect only a single tooth; however, certain trauma types such as automobile accidents and sports injuries involve multiple tooth injuries.<sup>1</sup> Traumatized anterior teeth is very devastating for a patient especially in young patients and also has a psychological impact on the patient and parents that's why it requires immediate attention. Ideally, a dental restoration should be as strong and natural as tooth structure. Therefore, in many clinical situations, reattachment of the fractured fragment is done. This restores the original tooth surface texture, contour, color, appearance, and shape of tooth.<sup>6</sup> The success of the reattachment depends on the several factors such as size of the fragment, periodontal involvement, biological width violation, duration of the fracture and contamination of the site, and material used for the reattachment.<sup>9</sup>

Adhesive reattachment requires minimum healthy tooth reduction and has a predictable esthetic result. It is usually faster than a complete composite restoration, plus patient also feels relief by keeping one's own natural tooth.<sup>5</sup> The development of resin-based materials that offer high bond strength values has made it possible to reattach the fragments by employing the modern dentin bonding agents or adhesive luting systems without imposing an additional retentive preparation of the tooth or fragment. We report the treatment of two crown fractures at various levels using this adhesive material, Super bond.

### Case Reports:

#### Case 1:

A 26-year-old male patient reported to us with the chief complaint of fractured maxillary central incisor due to the accident a day back. Intraoral examination showed Ellis Class IV fracture in the right and left maxillary central incisor. The fractured fragment was mobile and fracture line was extended subgingivally (fig. 1a & fig 1b). Thorough examination was done and all treatment options were explained to the patients. After informed consent, a treatment plan for reattachment of tooth fragment was considered. During treatment, under local anesthesia fractured fragment was removed and kept in the saline to prevent its dehydration. After access opening, working length was

taken and confirmed radiographically. The root canal was irrigated with 3% sodium hypochlorite (Septodont Novar pharmaceuticals) and prepared up to F3 with Protaper Universal (DentsplyMaillefer, Ballaigues, Switzerland). The root canal was dried using paper points and obturation was done with single cone. To stabilize the fractured segment intracanal post placement was done and post space was prepared upto #3 Peeso Reamer (LARGO, DENTSPLY Maillefer, USA) and an esthetic post (Angelus, Reforpost, Londrina, Brazil) of suitable size was placed to check its fit (fig. 1d).

After isolation, the fit of the fragment was checked. Green activator applied on both the segment and the tooth surface for 10 s. After rinse and dry, activated liquid was prepared and applied to the fragment and tooth surface, the fragment was placed in position and stabilized with digital pressure till the material sets. As it sets very fast, all these procedures were performed quickly. The patient was regularly recalled and followed up to 6 month.



**Fig.1a- IOPAR showing Ellis's class IV fracture 1b- Intraoral photograph showing fracture 1c- Fractured fragments 1d- Fibre post inserted 1e- Reattached fragments 1f- Intraoral photograph showing reattached fragments**

#### **Case 2:**

A 20-year-old female patient reported to the department of conservative dentistry and endodontics with the chief complaint of fractured central incisor due to accident 3 months back. Intraoral examination showed Ellis Class IV in central incisor(Fig.2b). Radiographic examination showed additional horizontal incomplete fracture at the coronal third of root(Fig.2a). After the examination, all treatment options were explained to the patient and reattachment of tooth fragment was planned. Informed consent was taken, single visit root canal treatment was performed. As additional root fracture was present in this case, intracanal post placement was necessary for stabilization of the fragment. Post space was prepared upto #3 Peeso Reamer (LARGO, DENTSPLY Maillefer, USA) and an esthetic post (Angelus, Reforpost, Londrina, Brazil) of suitable size was placed to check its fit (fig. 2d). Fragment stabilization was done in the same manner as in case 1(fig.2c). Follow-up was done up to 6 month.



**Fig.2a- IOPAR showing Elli's class IV fracture 2b- Intraoral photograph showing Elli's class IV fracture 2c- Fibre post inserted 2d- Intraoral photograph showing reattached fragments**

### **Discussion:-**

Crown-root fractures requires immediate functional and esthetic repair for better endodontic, restorative and periodontal prognosis due to the subgingival line of the fracture. Fracture of the tooth subgingivally presents restorative problems due to difficulty of access.<sup>10</sup>

Reattachment of dislocated tooth fragments with the new advanced dental bonding technology shows excellent results. They have eliminated many problems of differential wear of restorative material, unmatched shades and difficulty of contour and texture reproduction associated as compared to other techniques. It is seen that no other synthetic material can replicate esthetic characteristic like natural tooth.<sup>7</sup>

Factor influencing the extent and feasibility of such repair 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. The most widely used treatment method for the restoration of the traumatized tooth is the composite resin restoration this modality of treatment showed good results in cases where fracture line was above gingival margin but maintenance of isolation is the greatest problem in such cases.<sup>2</sup> Broken tooth can also be restored by full crown, but it is a more invasive procedure, and it also weakens the traumatized tooth more by removing most of its tooth structure. Hence, reattachment can be treatment of choice as in reattaching the fractured fragment the biological width is also not violated and also the esthetic outcomes are appreciable.

Super bond (Sun Medical. CO., Ltd) is a self-curing adhesive cement used for reattachment of crown in this case series. It contains 4-methacryloxyethyl trimellitate anhydride (4-META) as a diffusion promoter and tri-n-butylborane (TBB) as a polymerization initiator. The 4-META/MMA-TBB resin promotes the excellent bonding property and it is not affected by blood contamination, hydrophilic in nature because the increasing of acidic monomer concentration,<sup>7</sup> has a high tensile strength, and is biocompatible for periodontal ligament<sup>11</sup> and perhaps even more biocompatible, than other current luting materials, with fast, favorable, and nontoxic polymerization properties.<sup>4</sup>

Post-placement in addition to bonding, serves to retain the coronal portion via a friction bond, and assist in preventing dislodgement against non-axial forces as it is reported in earlier literature as well. In both the cases the patient's natural tooth anatomy, form function, and aesthetics all were restored and they have presented satisfactory result after six months of follow up.

### **Conclusion:-**

With the increasing esthetic demands of the patient, the reattachment of a tooth fragment should be considered as treatment of choice to restore function and esthetics. By adopting appropriate treatment strategy and a very conservative approach the treatment needs of the patient could be answered quickly keeping in mind its emotional impact on the patient.

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