

Fragment Reattachment of an Uncomplicated Crown Fracture

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ABSTRACT

The anterior maxilla is a common site for dental trauma. Crown fractures comprise 26-76% of all dental injuries. This case report presents management of uncomplicated crown fracture in a 21-year-old male patient through fragment reattachment.

INTRODUCTION

Traumatic dental injuries in the anterior maxilla are highly prevalent, particularly in children and young adults(1)The most commonly fractured teeth are the maxillary central incisors for both the primary and secondary dentitions(2–4). Crown fractures comprise 26-76% of all dental injuries in permanent dentition (5,6). Commonly caused by traumatic events, including blunt force trauma and penetrating injuries(5,7).In both the permanent and primary dentition, the incidence of the uncomplicated crown (involving Enamel-dentin) fracture is higher than complicated crown fracture(involving enamel–dentine–pulp)(8).Several treatment options, such as composite restoration, crown lengthening, orthodontic or surgical extrusion, or reattachment of the fragment, have been proposed. For uncomplicated fractures, reattachment of the fractured segment is the preferred treatment modality. In cases where reattachment is not possible, direct composite restoration is the recommended approach. Reattachment of the fractured fragment preserves the tooth's original alignment, restores function, aesthetics, surface brightness, form, and texture(9,10). This case study presents reattachment of the fractured maxillary anterior tooth with uncomplicated crown fracture.

CASE REPORT

A 21-year-old male patient reported with trauma to the maxillary left central incisor due to a fall accident a day before. (Figure 1).The patient had preserved the fractured fragment in water (Figure 2). On intraoral and radiographic examination, uncomplicated crown fracture in the middle third of the tooth was observed (Figure 1). The coronal fracture was oblique and supragingival, involving the enamel and dentin without any symptoms.The tooth had normal mobility with healthy periodontal tissues. The fractured fragment adapted well to the tooth. The tooth responded normally to both cold and electric pulp test. Radiographic examination revealed enamel and dentin loss without pulp exposure. Root development was complete without evidence of periapical pathosis, displacement, or root fracture.

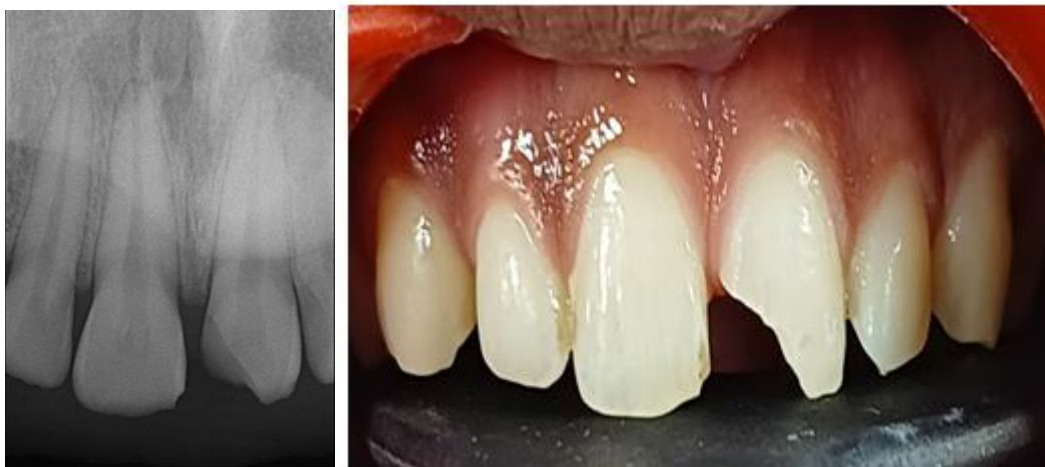


Figure 1 . a) Clinical presentation of uncomplicated crown fracture involving maxillary left incisor tooth(#21). B) Periapical Radiograph



Figure 2. Fractured Fragment

TREATMENT

The fractured fragment was stored in physiologic sterile saline solution for 20 minutes before bonding. After isolation of the affected tooth (Figure 3) an intraenamel circumferential bevel was given on both the fractured ends. A groove was made on the lingual aspect of the tooth and fractured ends. The fragments were etched with 37% phosphoric acid (Neotech gel, Orikam) for 15 seconds and rinsed with water. The tooth was then dried and dentin bonding agent (Scotch Bond, 3M ESPE) was applied and light cured for 20 seconds as per manufacture's instruction. After the fractured fragment as reapproximated over the tooth, light- cure resin composite material was (3M ESPE) applied and photo-polymerized for 40 seconds. Finishing and polishing was done using Sof-Lex system (Sof-Lex; 3M Espe) (Figure 4).



Figure 3. Rubber Dam Isolation



Figure 4. Postoperative Images

DISCUSSION

In crown fracture with exposed dentin, immediate measures are required towards dentin coverage to prevent bacterial ingress thus preventing pulp necrosis. Immediate treatment with the fractured fragment reattachment or composite restoration is preferred over temporary restoration as there is a risk of potential bacterial leakage(8). Fragment reattachment has several advantages such as restoration of surface morphology, a comparable wear rate to adjacent tooth and reduced chairside time(8). Several techniques of reattachment have been proposed such as Enamel bevelling, V-shape internal enamel groove, Internal dentinal groove, external chamfer, over-contouring and simple attachment (11).

In this study, enamel bevelling of both the fragment and the tooth crown was performed. This technique enhances fragment retention and aesthetics by altering the enamel prism orientation, thereby creating a more effective acid etch pattern(12). The internal dentinal groove allowed the placement of composite resin, thus reinforcing reattachment(13,14) . Rehydration of fractured fragment was done with saline according to the recent IADT

guidelines(15), as the moisture improves color, bond strength, and fracture resistance. The prognosis of reattachment depends on factors such as pulp vitality, but it is a rare complication (0%-6%) in tooth without luxation injuries(8).

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