ENDODONTIC & PROSTHETIC MANAGEMENT OF MAXILLARY CENTRAL INCISOR WITH ELLIS CLASS-IV FRACTURE: A CASE REPORT

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ABSTRACT

Anterior crown fractures are a common form of injury that mainly affect children and adolescents. The position of maxillary incisors and their eruptive pattern carries a significant risk for trauma. Functional, esthetic and biologic restoration of a fractured incisor often presents a daunting clinical challenge. This case report describes endodontic and prosthetic treatment of complicated crown fracture of maxillary central incisor.

Key Words: Trauma, Ellis class-IV fracture, Custom post.

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INTRODUCTION

Uncomplicated and complicated crown fracture is the most common traumatic dental injury to permanent teeth, and the teeth most commonly affected by trauma are the maxillary incisors, with a reported share of 96% of all the crown fractures (80% central incisors and 16% lateral incisors). This is attributable to their anterior position and protrusion caused by the eruptive pattern. This kind of injury mainly affects children and adolescents, with boys considered as being at a higher risk than girls mainly because of an increase in the participation of children in dangerous sports and activities.

Several factors influence the management of tooth fractures, including extent of fracture (biologic width violation, endodontic involvement, alveolar bone fracture and restorability of fractured tooth) secondary trauma injuries (soft tissue status), presence/absence of fractured tooth fragment and its condition for use (fit between fragment and the remaining tooth structure), occlusion, aesthetics, finances and prognosis. The objective of the present paper is to describe the endodontic and prosthetic management of maxillary central incisor with Ellis class-IV fracture.

CASE REPORT

A 16 year old male patient reported with a chief complaint of fractured upper anterior teeth. He gave a history of fall 1 year back with a missing fragment of fractured upper front tooth. Immediately after trauma patient had visited nearby dentist, who prescribed medication for relieving pain. Clinical examination revealed presence of Ellis class III fracture in maxillary left central incisor (21) (figure 1). Tenderness on percussion was negative and the tooth was discolored. Patient had no other soft tissue lesions. No mobility was observed in the teeth. Heat and cold test were negative and on electric pulp sensibility test there was no response. Radiographic examination revealed no periapical radiolucency (figure 2).

Treatment was initiated with access cavity preparation in 21 under rubber dam isolation (figure 3). Necrotic pulp tissue from the root canals was extirpated and canal was irrigated with physiological saline and dried with paper points. Working length was established 1 mm short of apex (figure 4). Biomechanical preparation was done (step back) with k file up to size 60 (figure 5).

The canal was once again irrigated with physiological saline and then dried with paper points. Root canal was then filled with Calcium hydroxide for one week and the access cavity was restored with temporary restorative material. After one week the root canal was irrigated properly with 5.25% sodium hypochlorite and finally obturated with gutta-percha and zinc oxide eugenol sealer with the lateral condensation technique (figure 6).
The patient was recalled after 7 days. At the same visit tooth preparation and post space preparation was done in 21 (figure 7). Gutta-percha within the canal was removed up to 5 mm short of obturated length (figure 8). Post space direct impression was made with the help of inlay wax (figure 9). After 3 days cast metal post was luted (figure 10, 11 & 12) and shade selection was done (figure 13). In the same appointment impression was made and cast was poured and temporary crown was cemented (figure 14). After 2 days permanent crown was cemented (figure 15 & 16).

Figure 1: Preoperative photograph

Figure 2: Preoperative radiograph

Figure 3: Access opening

Figure 4: Working length

Figure 5: Master cone fit radiograph

Figure 6: Obturation

Figure 7: Tooth preparation
Figure 8: Post-space preparation done

Figure 9: Post-space direct impression made

Figure 10: Cast metal post

Figure 11: Cast post Luted

Figure 12: Radiograph after cast post luted

Figure 13: Shade selection done

Figure 14: Temporary crown

Figure 15: Permanent Crown

Figure 16: Radiograph after permanent crown
DISCUSSION

Reports have shown that 25% of school-aged children will experience some kind of dental trauma. Among the child and teenage population, the possibility of suffering orofacial trauma is high and actually is considered a dental public health problem. Crown fractures with pulp exposure represent 18% to 20% of traumatic injuries involving the teeth, the majority being in young permanent teeth. Complicated crown fractures are defined as fractures involving enamel and dentin with pulp exposure. These injuries produce changes in the exposed pulp tissues, and a biological and functional restoration represents an important clinical challenge. In these cases, inflammation or contamination is generally present.

For traumatized teeth with complicated crown fractures in young patients, treatment options include direct pulp capping, partial pulpotomy, cervical pulpotomy, pulpectomy, or extraction, depending on the time between the trauma and treatment of the patient, degree of root development, and size of the pulp exposure.

In this case report as the tooth was non-vital root canal therapy was initiated followed by cast post and crown. Cast post was made because it is a custom fit post also its strength as well as retention is more as compared to prefabricated post.

CONCLUSION:

The treatment strategy of complicated crown fracture is complex, due to pulpal exposure which produces pulpal changes. Root canal therapy was done. Custom post was cemented in 21 to reinforce the cervical level of restoration. PFM crown preparation was done and later PFM crown cemented in 21. Patient was followed up to 6 months. Further follow up was needed to evaluate the success of treatment.

REFERENCES


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