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Esthetic management of complicated crown fracture of 13 years old patient with rotary endodontics - A case report.

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Abstract

Majority of the traumatic dental injuries involves the anterior teeth specially the maxillary incisors. There are several treatment modalities for such condition, one of which is endodontic treatment followed by composite build up for better esthetics.

Patient cooperation and understanding of the limitations of the treatment is of at most importance for good prognosis. The present case report describes Esthetic management of a complicated crown fracture of maxillary right central incisor using rotary endodontics followed by 3M Filtek Z350 composite build up.

Keywords: Complicated crown fracture, rotary endodontics, 3M Filtek Z350 composite, trauma.

Introduction

The most common consequences of traumatic injuries are the crown fractures that mostly involve the maxillary anterior teeth with varied incidence from 37% to 66.7% because of its position in the dental arch, whereas the mandibular anterior teeth are less frequently involved.[1]

The third most common cause of tooth loss after dental caries and periodontal disease [2] is the tooth fractures that have been described as a significant dental disease.[3] These types of traumatic injuries can have a variety of causes, very much depending on the age group involved. In young age it can be due to falls and sports, and in adolescents mainly due to assaults or road traffic accidents.[4]

The array of traumatic injuries is from simple chipping of enamel to avulsion of the whole tooth. It can be uncomplicated to complicated, either involve the pulp or spare the pulp.[5]

Uncomplicated crown fractures involve the enamel infraction, enamel fractures, enamel-dentine fractures, whereas the complicated crown fractures usually present with a slight hemorrhage from the exposed part of the pulp. If treatment in young teeth is delayed for days or weeks proliferation of pulp tissue (i.e., pulp polyp) can occur. Pulp exposure is usually followed by symptoms, such as sensitivity to thermal changes.[1]

Whatever might be the cause, the choice of treatment and management for complicated crown and/or root fractures which involves the pulp is multifactorial, and depends on variety of factors like tissues involved, age of the patient, eruption status with apex development of the tooth, type of injury, severity of the injury, status of underlying pulp tissue, time elapsed between the occurrence of an accident and the treatment rendered as well as concomitant periodontal injury. All these factors affect the prognosis or outcome of the treatment. [1,5]

Fracture of the anterior teeth due to trauma requires immediate attention not only to restore immediate function and esthetics but also because of its psychological impact on the patient.[1]

The aim of this article is to do the Esthetic management of a complicated crown fracture using rotary endodontics followed by composite build up.

Case report

A 13-year-old boy reported to the department of pedodontics and preventive dentistry, Himachal Dental Collage and Hospital, Sundar Nagar with a chief complaint of pain on chewing in upper front region of the jaw since four days after fall from bicycle. Pain was sharp in nature, non-radiating, aggravates on chewing and hot food and beverages. Intraoral examination revealed complete permanent dentition with class I molar relation. Pin point pulp exposure of 1-2 mm was present clinically which revealed Ellis class III fracture with symptomatic pulpitis. Radiographs showed the coronal fracture that extended obliquely from incisal edge to the middle third of the tooth.

Figure 1: Pre-operative Photograph.

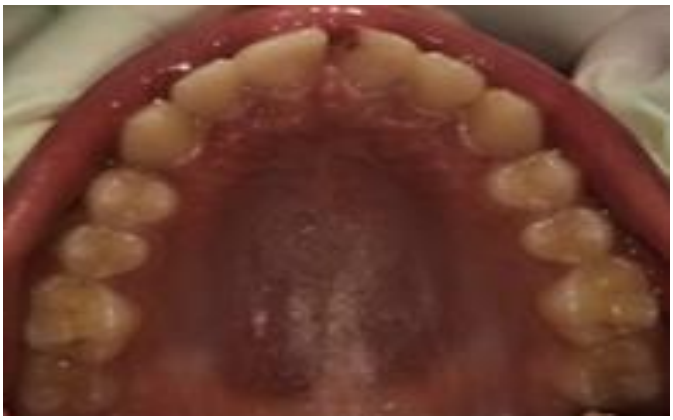

Figure 2: Pre-operative Intraoral Photograph.

Figure 3: Pre-operative IOPAR.

Figure 4: Working length IOPAR.

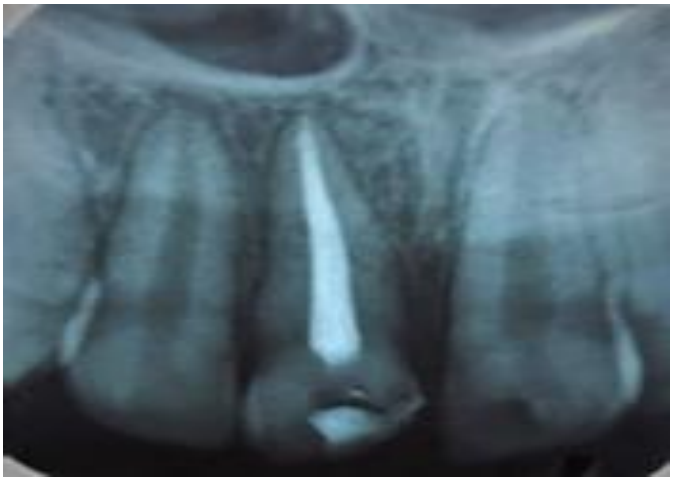

Figure 5: Post obturation IOPAR

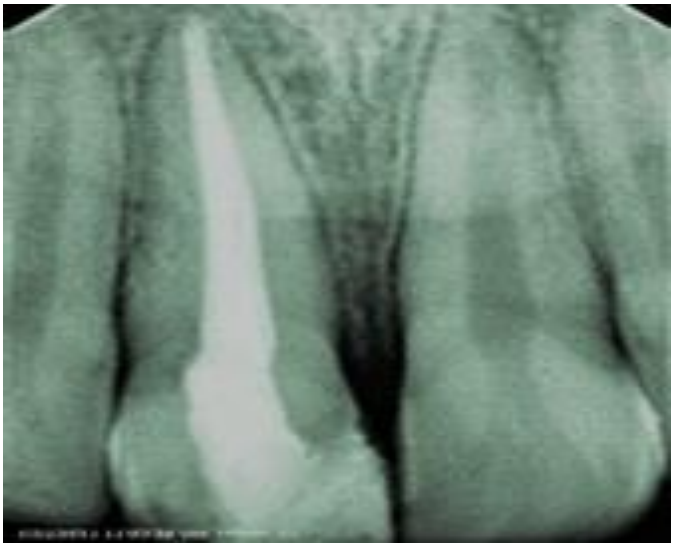

Figure 6: Post obturation IOPAR with composite restoration.

Figure 7: Pre-operative Photograph.

Figure 8: Post operative Photograph.

Patient reported after four days of trauma with Ellis class III fracture and symptomatic pulpitis so the root canal treatment was planned.

After isolating the area and administration of local anesthesia, access was gained labially through the fractured region. For patency K-file size #40 was passively entered into the canal and working length was established. The pulp was removed with H-file size #40 and the canal was irrigated with 5.25% sodium hypochlorite to remove any pulpal remnants and then irrigated with saline.

A glide path was performed using Pro Glider (Dentsply Maillefer; size 16, 0.02 taper) file to the working length. Instru mentation done with Protaper Gold Ni-Ti rotary files to the working length with crown down technique using the following sequence: SX, S1, S2, F1, and F2. The first three shaping files were used with a brushing action, and the last two finishing files were used with a non-brushing action until the working length was reached. During instrumentation, the canal was irrigated with 5.25% NaOCl.

After instru mentation, 17% EDTA (Sigma–Aldrich, Riedel de Haën, Switzerland) was applied for 3 min and then irrigated with normal saline followed by final irrigation with Dento chlor (AMMDENT, 2% Chlor hexidine Di gluconate). After the preparation was completed, root was filled with respective gutta-percha and AH Plus as a canal sealer. The gutta-percha cone was cut at the same level with the cement oenamel junction.

The canal was then sealed with a permanent filling material. Post-obturation IOPA radiograph was taken and root canal filling was found to be satisfactory. The prepared tooth was etched with 37% phosphoric acid for 15 seconds followed by washing and drying. Following this, 3M Single Bond Universal bonding agent was applied to the tooth structure and 3M Filtek Z350 composite restoration was done according to the manufacturer instructions and cured for 20 seconds using LED light. Premature contact between the incisors was detected using articulating paper, and the excess was removed.

Discussion

A crown fracture through the pulp chamber causes laceration and exposure of the pulp to the oral environment. Healing does not occur Sponta neously.[6] The early changes in the pulp are hemorrhage and local inflammation, caused by breakdown products from lacerated tissue and bacterial toxins.[7,8]

The fibrin clot that forms over the wound surface resolves after a couple of days. The subsequent changes can be proliferative, such as a pulp polyp, or destructive, such as pulp necrosis and abscess formation. The most common early response is formation of granulation tissue at the exposure site.[1]

After trauma to maxillofacial region, fracture of the anterior teeth is common sequelae. As it is related to Esthetic appearance, it is of prime concern to the patient. Thus, clinician should efficiently manage such type of injury. Management should be as conservative as possible with maximum positive outcome.[9]

Treatment modality ranges from simple restorative treatment to reimplantation or extraction of involved teeth. However, a general consensus can say that ‘more conservative the treatment- better the prognosis.[5]

Various treatment approaches have been indicated for fractured teeth that depends upon the time elapsed between occurrence of injury and treatment rendered. These are

1. If patient report within 1-2 hr with vital small pulp exposure less than 1mm, pulp capping can be carried out.
2. If patient report 48-72 hrs or 2-3 days after injury with immature teeth, pulpotomy or regenerative endodontic procedures can be carried out.

3. If patient report more than 72 hrs or 3 days after injury with mature teeth, root canal treatment can be done.[1,9]

It is also apparent that teeth with mechanical or traumatic pulp exposures have higher success rates than teeth with cariously exposed pulps.[10] The reported frequency of success after filling of the root canal with various materials varies from 80–96%.[11-14]

In this present case the patient reported after four days with Ellis class III with symptomatic pulpitis. The goal of the treatment was to alleviate the pain of the patient, restore the aesthetics, and reinforcing strength required for mastication. To alleviate the pain, root canal treatment was performed and simple composite build up was done to restore the esthetics.

Conclusion

Tooth fractures are a common dental problem that present, and require treatment, in a multitude of forms and may adversely affect tooth longevity. This case report describes an alternative method of treatment of complicated crown fracture. Though convincing to use, it is not a universal approach for treatment of fractures. Studies with long term follow-up should be undertaken to warrant this approach.

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