



## Going an extra mile for a perfect aesthetic smile – A case report

Dr. Priyanka Desai<sup>1</sup>, Dr. Nimisha Shah<sup>2</sup>, Dr. Sankalp Mahajan<sup>3</sup>, Dr. Neel Shah<sup>4</sup>

<sup>1,3,4</sup>Student, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat

<sup>2</sup>Head of Department, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat

### ABSTRACT

*Traumatic injuries to the anterior tooth are the most common finding in the day to day practice with the incidence of complicated crown fractures ranging from 2% to 13% of all dental injuries. The most commonly involved tooth is maxillary central incisor leading to damage of the crowns. Different treatment approaches are indicated for the management of fractured teeth, depending on their location. More difficulties are always faced when the fracture line extends below the bone level, orthodontic extrusion or surgical extrusion remains as a treatment option. Though orthodontic extrusion is an ideal approach, sometimes due to limitations of time or unavailability of the patient for a longer period of time, we have to opt for the surgical extrusion. So here is the case with traumatic anterior tooth managed with surgical extrusion.*

**Keywords**— Crown fractures, Dental trauma, Orthodontic extrusion, Surgical extrusion

### 1. INTRODUCTION

Traumatic injuries to the anterior tooth are the most common finding in day to day practise. Mostly as a result of sports activities, falls, accidents, fights, intentional assaults & systemic conditions like epileptic seizures etc. Blows to the face often affect maxillary incisors because of their normal labial projection in relation to the mandibular incisors, leading to damage to the crowns<sup>1</sup>.

Different treatment approaches are indicated for the management of fractured teeth, depending on their location. More difficulties are always faced when the fracture line is subgingival or involves the pulp as it's difficult to perform the bonding procedures in a contaminated environment. Gingivectomy/crown lengthening followed by reattachment is the most recommended conservative treatment option. When the fracture line extends below the bone level, orthodontic extrusion or surgical extrusion remains as a treatment option. Though orthodontic extrusion is an ideal approach, sometimes due to limitations of time or unavailability of the patient for a longer period of time, we have to opt for the surgical extrusion<sup>2</sup>. So here is the case with traumatic anterior tooth managed with surgical extrusion.

### 2. CASE REPORT

A 25-year-old male patient reported to Department of Conservative Dentistry and Endodontics, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth with a chief complaint of fractured upper front tooth since 1 day due to the accident. His medical history indicated epilepsy since childhood & before 2 years when he got an epileptic attack, which led him to fractured central incisor. (Figure 1a) Fracture line was extending subgingivally on the palatal side but above the bone level so at that time gingivectomy followed by reattachment of the fractured tooth in its position was done. (Figure 1b) Since 2 years the patient was asymptomatic.



Fig. 1(a): shows Fractured central incisor before 2 years



Fig. 1(b): shows Reattachment in its position

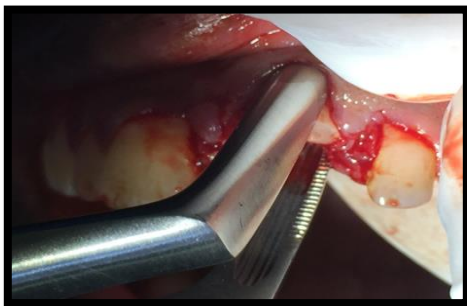


**Fig. 2: shows Pre operative photograph with a fractured tooth segment**



**Fig. 3: shows Pre operative photograph with compromised palatal side**

After 2 years due to sports injury, he had a fall again & the same reattached tooth got fractured. (Figure 2) This time the fracture line has extended below the gingiva & palatal side of the tissue was compromised due to the impact. (Figure 3) The fractured segment was mobile. It was difficult to restore again with reattachment alone using the same previous procedure as it will affect the biologic width of gingiva. So, Patient was advised to go for orthodontic extrusion as he was having favourable crown root ratio. The patient was not willing for it as he was coming from a far distance & he wants an early correction of his aesthetic as per last time experience. So, Surgical extrusion of the tooth was decided by the operator and was accepted by the patient to bring the fracture line at the equigingival level. (Figure 4a)



**Figure 4 (a): shows Surgical extrusion**



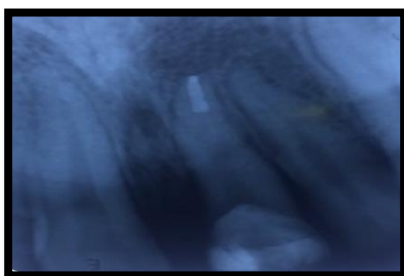
**Fig. 4(b): shows 3 mm of tooth extrusion**

Surgical extrusion was done by Postgraduate of Oral & Maxillofacial Surgery. Infraorbital block with 1.5 ml of anaesthesia & Nasopalatine Block with 0.5 ml of anaesthesia were injected. The mucoperiosteal flap in relation to central incisor was raised & with maxillary root forceps, a traumatic luxation was done by giving rotational movement & tooth was extruded 3 mm from the socket maintaining the favourable Crown: Root ratio. (Figure 4b) After obtaining haemostasis, stabilization of tooth was done by placing fiber splint. (Figure 5)



**Fig. 5: Fiber splint placed for 3 weeks**

After 3 weeks the splint was removed and tooth was found firm in the socket. Later, the fractured post was removed from the radicular portion of root & access cavity was modified. As there was intact sealed gutta percha with no periapical radiolucency, the root canal procedure was not repeated. Post space was irrigated with normal saline & dried with paper points. Firstly, customized ever-stick fibre post of 0.9 mm diameter was tried in the canal & confirmed with a radiograph. 3 mm of fiber post was exposed for the core build up. (Figure 6a) It was then cemented with calibra resin cement & core build up was done with composite. (Figure 6b)



**Fig. 6(a): shows Radiograph of Fiber post**



**Fig. 6(b): shows Fiber post placement with core build up**

The patient was also interested in getting aesthetic correction of his smile. There was a uniform spacing present between all upper anterior with midline diastema. Considering the feasibility & financial condition of the patient, direct composite laminates were planned for 11, 12, 13, 22, 23. The impression of the maxillary arch with heavy body silicone material was taken for wax mock up. The mandibular arch impression was taken with alginate material. Mock up was done with wax. The template was prepared from mock up model. The template was placed in mouth & space closure was done on all the 5 teeth excluding central incisor by minimal enamel preparation & following etch-bond protocol. Then incremental placement of composite resin was done using the layering technique and cured for 20 seconds.



**Fig. 7: Shows Crown preparation**

After the aesthetic correction of anterior teeth & considering the shade of build up teeth, crown preparation of 2mm of central incisor was done keeping the margins sub gingival. (Fig. 7) Gingival retraction cord was placed & impression of the maxillary arch with heavy body silicone followed by light body material was taken. The shade selection was done based on build up of adjacent teeth with VITA Shade guide. All ceramic crown (E-Max) was cemented with silane coupling agent & follow up was done. (Figure 8)



**Fig. 10: shows Post operative photographs**



**Fig. 9: Preoperative Photograph**

**Fig. 10: Postoperative Photograph**

### **3. DISCUSSION**

Clinical studies have shown that orthodontic extrusion may be the ideal treatment. However, it may have some disadvantages like it's time-consuming and has a long retention period, making the patient's cooperation a critical factor<sup>1</sup>. On the other hand, it has also been shown that surgical techniques may be useful to extrude and save the root<sup>2</sup>. In comparison to orthodontic extrusion, surgical extrusion is a one-step procedure, simpler and less time-consuming than orthodontic extrusion.<sup>2</sup>

Çalışkan demonstrated that this treatment modality was successful because surgical extrusion prognostically could be compared with extrusive luxation of teeth which has a favourable prognosis with a low incidence of root resorption. Because the root does not leave the alveolar socket, the potential deleterious effect of drying the periodontal cells is eliminated. Since the viability of the cementoblasts is a major factor for the healing of the socket and formation of periodontal membrane surgical extrusion have such advantages on healing.<sup>3</sup>

ANGELUS INTERLIG Braided glass fiber impregnated with light-cured composite resin splint was used as it is an excellent material for splinting with respect to patient comfort, durability, resistance to fracture, biocompatibility and esthetic acceptability. It takes less time than traditional methods, is less bulky and exceptionally failure resistant.<sup>4</sup>

Everstick Fiber posts are soft, flexible and unpolymerized glass fibre post which can be individually adapted to the shape of the root canal before light-curing while offering high strength after light curing. Their elastic modulus, similar to that of dentin, which should improve the stress distribution within the root and reduce the risk of vertical root fractures. They are unidirectional, which increases the fracture resistance.<sup>5</sup>

E-max all ceramic crown is preferred for its long lasting, aesthetic qualities. Crown is made from a single block of lithium disilicate ceramic. This is top grade material which has been harvested for its toughness, durability and opaque qualities which makes it a highly prized crown. The crown is considered to be the best match with your own natural teeth. The translucency of E-max crowns allows in more light. This creates a more lifelike crown that requires no stain.<sup>6</sup>

The direct composite build up was done as it exhibits excellent scores with regard to colour match, marginal adaptation, surface texture, marginal discoloration.<sup>7</sup>

#### **4. CONCLUSION**

Such cases of trauma should be handled with a multidisciplinary approach. A piece of proper background knowledge about the case and clinical procedure is a must. Treatment planning and each discipline intervention should be pre planned. Endodontics and aesthetic dentistry can act as a salvager in such cases.

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#### **BIOGRAPHIES**



**Dr. Priyanka Desai**

P.G. Student, Department of Conservative Dentistry and Endodontics  
K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat, India



**Dr. Nimisha Shah**

Professor and HOD, Department of Conservative Dentistry and Endodontics  
K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat, India



**Dr. Sankalp Mahajan**

P.G. Student, Department of Conservative Dentistry and Endodontics  
K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat, India



**Dr. Neel Shah**

P.G. Student, Department of Oral and Maxillofacial Surgery  
K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara, Gujarat, India