

Reattachment of fractured segment: The instant remedy

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ABSTRACT

Trauma to the anterior tooth is a more frequent occurrence due to their position in the arch. Fractured anterior tooth if left untreated can cause damage to the dentition and can even have the psychological impact on the patient. Conventional methods used for the restoration of fractured teeth are time consuming, expensive and not conservative. While reattachment of fractured tooth segment can be a viable alternative. This process allows minimal sacrifice of the tooth structure, and allows better esthetics in less time

Keywords: Trauma, Reattachment

INTRODUCTION

Trauma to maxillary anterior teeth is most commonly encountered situation. It is mainly due to the position of teeth in the arch.¹ Teeth in lower anterior region are less frequently affected.² Among the traumatic injuries, complicated and uncomplicated crown fractures are most common. Coronal fractures of permanent incisors accounts 18-22% of all trauma to dental hard tissues, 28-44% being uncomplicated and 11-15%, complicated (enamel +dentin +pulp). Of these, 96% includes maxillary central incisors.³ Males are more frequently affected than females.⁴ Fractured tooth in anterior region is of great concern.⁵ This creates problems in esthetic, phonetic and function.¹ If timely treatment is not provided, this might lead to the loss of dentition and can even have psychological impact on the patient.⁵ Various options for management of fractured teeth can be: Direct composite resin restorations, Laminate veneers and Crowns. But these treatment modalities are more expensive, time consuming and not conservative at all.¹ So, Reattachment of fractured segment stands as a viable alternative. It is indicated when the fractured segment is retained or recovered in a reasonable time, when there is minimal or no violation of the biological width with a correct fit between the fractured segment and remaining tooth structure.⁶

CASE PRESENTATION

A 19 years old male patient reported with a chief complain

of broken tooth in upper front region of jaw since 1 day. The tooth was symptomatic. Clinical examination revealed a complicated oblique fracture on 22 and uncomplicated crown fracture on 21 (Figure 1, 2 and 4).

In tooth wrt 22, the fracture was extended 1mm subgingivally on the palatal aspect. The fractured segment was being held by the gingival attachment (Figure 4). Intraoral periapical radiograph revealed an intact periodontal ligament space, complete root formation and no associated root fracture (Figure 3). Both these tooth were responsive on Electric Pulp Test (EPT). No significant medical history was reported by the patient. Various treatment options were explained to the patient:

- Reattachment of fractured segment after endodontic treatment, gingivectomy and fiber post placement
- Endodontic treatment followed by crown lengthening by gingivectomy or orthodontic extrusion followed by placement of crown

Patient opted for the reattachment of fractured segment as he was more esthetically concerned and also wanted to keep his original tooth rather than the prosthesis. So, the case was planned to be managed by reattachment of fractured segment after root canal treatment and fiber post reinforcement.

Under local anaesthesia, the mobile fractured segment was removed (Figure 5) and kept in normal saline (Figure 6). Single visit root canal treatment was done under rubber

dam isolation (Figure 8-11). During obturation, sectional method of obturation was done with resin based sealer (Epoxyseal) (Figure 11). Post space preparation was done on canal and on fractured tooth segment.(Figure 11 and 12). Esthetic fiber post No 1 was selected (Figure 13). Gingivectomy on palatal aspect was done via laser (Diode laser: Biolase) (Figure 14 a and b). Etching and bonding protocol was followed for the fiber post as well as the fractured tooth segment (Figure 15). Fiber post cementation and fractured fragment reattachment was done using dual cure resin based cement (NexCore) (Figure 17). Then a layer of composite was added on the fracture line and finishing and polishing was completed (Figure

19). Post operative instructions were given to the patient as to avoid biting hard foods from anterior teeth and to follow the basic oral hygiene measures.

For tooth wrt 21, biodentine was used as capping material (Figure 19). Then build up was done with composite (Fig 20).

On follow up visits, patient was asymptomatic with the tooth being firm, non- tender without any signs of swelling, sinus tracts. Along with this, gingival healing was found satisfactory (Figure 21 and Figure 22). Also, Electric Pulp Test was done which showed that the tooth wrt 21 was responsive.



Figure 1: Pre-Operative (Labial view)



Figure 2: Pre-Operative (Palatal view)



Figure 2: Initial IOPA



Figure 4: Mobile Fractured segment before removal



Figure 5: Fractured segment after removal



Figure 6: Fractured segment stored in Normal saline



Figure 7: Pulpal exposure visualized after fractured segment removal



Figure 8: Refined access opening with file in place for working length determination



Figure 9: Working length determination



Figure 11: Sectional method of obturation and post space preparation



Figure 12: Post space preparation in fractured segment



Figure 13: Fiber post selection



Figure 14: (a) During Laser Gingivectomy
(b) Palatal aspect after gingivectomy



Figure 15: Etching and bonding for both fiber post and fractured segment



Figure 16: Fiber post cementation and reattachment of fractured segment with dure cure resin cement



Figure 17: Post- Operative Palatal view



Figure 18: Post- Operative Labial view



Figure 19: Placement of Biodentine as a capping material wrt 21



Figure 20: Composite build up wrt 21



Figure 21: Follow up after 1 month



Figure 22: Follow up after 3 months

DISCUSSION

Trauma to anterior teeth requires immediate attention due to an esthetic concern.⁷ One conservative method of management of tooth is reattachment of fractured segment. The present case describes the complicated crown root fracture where the fractured segment was reattached by a multidisciplinary approach.⁸ Reattachment of fractured segment has certain advantages, most of which is related to esthetics as it preserves the original shape, color, brightness, and surface texture of enamel.⁹ Besides this, it is conservative, safe, simple, cost-effective and less time consuming.¹ Reattachment of fractured segments has become successful these days because of the advancements in adhesive technology.⁹

In our case, the fracture line has extended subgingivally and there was minimum encroachment on the biologic width. So we did the gingivectomy on palatal aspect and no osteotomy was needed.⁵

Rehydration of fractured segment is necessary to retain its original color translucency, and to gain adequate bond strength.¹

Various literature suggests that the fractured segment can be reinforced with the post. We used the fiber post in our case. Fiber post was cemented with the help of dual

cure resin cement. Advantages of resin based restorative materials include suitable modulus of elasticity, enhanced esthetics, good bonding between post and cement, lower chair time, and minimal tissue removal.⁵

CONCLUSION

With the development of newer materials and the adhesive technology, the esthetic results are enhanced with the predictable outcomes. So, Reattachment can be an alternative instant remedy for the conservative management of fractured anterior tooth.¹⁰



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