RESEARCH PAPER | Medical Science | Volume : 5 | Issue : 3 | March 2015 | ISSN - 2249-555X

A Case Report on Autogenous Method for Aesthetic Rehabilitation of Fractured Anterior Tooth

KEYWORDS: Esthetic, Fragment reattachment, Autogenous, Biologic method

Dr. Udhya. J M.D.S	Dr. Varadharaja M.M. M.D.S	Dr.Vignesh Kumar .V M.D.S
Senior lecturer, Department of Pedodontics and Preventive Dentistry, C.S.I. College of Dental Sciences &Research Hospital, Madurai.	Reader, Department of Orthodontics, C.S.I. College of Dental Sciences &Research Hospital, Madurai.	Reader, Department of Orthodontics, C.S.I. College of Dental Sciences &Research Hospital, Madurai.

ABSTRACT *The fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents. One of the therapeutic options for managing coronal tooth fractures when the tooth fragment is available and there is no or minimal violation of the biological width is the Autogenous reattachment of the dental fragment. Reattachment of fractured tooth fragments can provide good and long-lasting esthetics (because the tooth's original anatomic form, color, and surface texture are maintained). It also restores function, provides a positive psychological response, and is a relatively simple procedure. Patient cooperation and understanding of the limitations of treatment is of utmost importance for good prognosis. This article reports on case of coronal tooth fracture that were successfully treated using ultra conservative Autogenous biologic method of esthetic rehabilitation by fragment reattachment.*

Introduction:

The maxillary central incisors are the teeth most susceptible to fractures caused by direct trauma such as contact sports, road traffic accidents and falls. Aesthetic rehabilitation of crown fractures of the maxillary anterior is one of the greatest challenges to the dentist [1]. Several factors influence the management of coronal tooth fracture including extent of fracture, endodontic involvement, alveolar bone fracture, presence /absence of fractured tooth fragment, and the fit between the fragment and the remaining tooth occlusion, esthetics [2, 3]

Chosack and Eildeman published the first case report on reattachment of a fractured incisor fragment in 1964 [4]. Factors that influence the success of reattachment include the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of the root formation, biological width invasion, occlusion, time material used for reattachment, use of post, and prognosis[5]. Reattachment of intact natural tooth fragment is advantageous compared to crowns since color, morphology, translucency can be retained and treatment is immediate.

This article reports on coronal tooth fracture cases that were successfully treated using Autogenous tooth fragment reattachment.

Case report:

A 13 years old male patient injured during a road accident had sustained a complicated Ellis class III fracture.

Figure : 1 Pre Op Clinical Photograph

On clinical examination tooth was tender on percussion with a mobile coronal fragment (Fig. 1).There was bleeding on probing the fragment and no soft tissue injury was observed.

Radiographic observation revealed a fracture line at the cervical line of the upper right central incisor (Fig 2). On periodontal examination the coronal tooth fragment was still attached palatally by fragile soft tissue.

Figure 2: Pre Op IOPA Radiograph

Volume : 5 | Issue : 3 | March 2015 | ISSN - 2249-555X

A treatment plan was formulated to immediately reattach the natural tooth fragment since the patient was concerned about aesthetics. Local anesthesia was administrated and fractured coronal fragment was removed with a forceps without damage and stored in saline (Fig 3).

Fig :3. Extracted fracture fragment

Under rubber dam vital pulp tissue was extirpated from the root canal. Working length was determined using Ingles technique and confirmed by apex locator (RootZX). Biomechanical preparation was done by crown down technique, followed by obturation of the canal using lateral condensation technique.

Fig 4: Endodontically treated 21

Reattachment of fragment:
In order to improve the adhesion between the fragment and the tooth, retention grooves [6] were prepared in the fragment and 45 degree external circumferential beveling [7] was done in the natural tooth (Fig 5a,5b).

Fig 5a: Retention Grooves on natural tooth

Fig 5b: Retention Grooves on extracted fragment

Fragment & teeth were subsequently cleaned with 2 % Chlorhexidine solution, rinsed & lightly air dried. The fractured crown segment and the tooth was etched for 15 sec, rinsed for 5 sec and air dried for 5 sec. Dentin bonding agent was applied and light cured for 40sec. A thin layer of composite was applied over the apposing surface of the fragment and the remaining tooth structure.

Fig 6: Fragment reattachment

Excess composite was removed with a sable brush using "Wet Brush Technique" [8]. The tooth was cured both labially and palatally for 40s each. Finishing and polishing was performed for the tooth (Fig 6) and the patient was kept on recall for 1 month, 3 month and 1 year.

Discussion:
Andreason indicates that fracture of the crown with pulp exposure is between 5 % & 8 % of all traumatic injuries[2] Several factors influence the management of coronal tooth fracture . Extent of fracture, endodontic involvement, alveolar bone fracture, presence /absence of fractured tooth fragment, and the fit between the fragment and the remaining tooth structure [2,3]. One of the options for managing coronal tooth fracture is reattachment of tooth fragment when it is available. Reattachment of a fragment to the fractured tooth can provide good and long-lasting esthetics. Retention of original tooth anatomic form, color, surface texture, translucency, opalescence fluorescence and texture of the surface are reasonably economical, less time consuming. Thus, Autogenous reattachment is more advantageous than homogenous attachment, superior to the composite resin restoration. Restoring function & esthetics with a conservative approach, provides a more predictable long-term outcome than direct composite restoration[10].

The factors that influence the success of reattachment of fragment are

1. Storage medium for fragment

2. Type of Retention provided

Volume : 5 | Issue : 3 | March 2015 | ISSN - 2249-555X

3. Material of choice for reattachment

1.Storage medium for fragment: The medium of dental fragment conservation is important to maintain fragment hydration. The best medium for a short duration is physiological solution

2. Type of retention provided : Methods employed to improve adhesion between the teeth & fragment are [10]

1. 45 degree external circumferential bevel before reattachment -

2. Placing the chamfer at the fracture line after bonding

3. Using a V-shaped enamel notch – provides both retention & support

4. Placing an internal groove – Increases retention & resistance

5. Superficial over contour over the fracture line

6. Placement of post – Increases the retention & distributes the force along the root.

3. Material of choice for reattachment: Recently, with the advancement in the materials and bonding techniques, this biologic method of retaining fractured tooth segment is gaining popularity. The wide range of materials available in the market today makes the choice of material difficult. Various materials such as flowable composite, dual cure or resin modified glass ionomers can be used[4] In this case, flowable composite was used, the advantage being bond strength, aesthetics, complete curing.

In our case, retention technique used have found to be esthetically & functionally in good condition at the first year recall visit, suggesting fragment reattachment can be a choice of treatment in management of anterior traumatic teeth, if the original tooth fragment is retained following fracture.

Wadhwani et al [10] reported a successful one year follow up of esthetic reattachment of a coronal fragment in a complicated crown fracture of permanent right central incisor. Macedo GV et al [11] reported two coronal tooth fracture cases that were successfully treated using tooth fragment reattachment. Reattachment of fractured tooth fragment offers a viable restorative option for the clinician because it restores tooth function and esthetics with the use of very conservative and cost effective approach.

Preeti Kore et al [12] reported a successful one year follow up of esthetic reattachment of a coronal fragment in a complicated crown fragment of permanent right central incisor

The need of the day is to educate the population to preserve the fractured segment and seek immediate dental treatment.

Conclusion:

Recent development in restorative materials, placement techniques, preparation designs, adhesive protocols, allow clinicians to effortlessly complete this procedure in a single appointment. Thus, reattachment of the intact fractured segment can be considered as an ultraconservative biologic method for aesthetic rehabilitation and it is an excellent choice of treatment.

REFERENCE

1. Joshi N,Shetty N,Kundabala M.Immediate reattachment of fractured tooth segment using dual cure resin. Kathmandu University Medical Journal 2008;6(3):386-388 | 2. Andreason JO, Andreason FM.Fractured tooth fragment reattachment. Textbook & color atlas of traumatic injuries to the teeth.3rd edition.Copenhagen: Munksgaard publishers; 1993:p.151-177 | 3.Olsburgh S, Jacoby T,Krejci J.Crown fracture in the permanent dentition: pulpal and restorative consideration. Dent Traumat 2002; 18:103-115 | 4.Reis A,Loguercin AD,Kraul A,Matson E. Reattachment of fractured teeth: A review of literature regarding techniques and materials. Oper Dent 2004;29(2):226-233 | 5.Wadhwani CPK.Asingle visit, multidisplinary approach to the management of traumatic tooth crown fracture. Br Dent J 2000;188: 593-598. | 6.Walker M. Fractured –tooth fragment reattachment.Gen Dent 1996; 44: 434-436 | 7. Baratieri LN,Monticro S Jr,de Albuqueuque FM, Vieira LC,de Andrada MA.Reattahment of a tooth fragment with a new adhesive system: A case report. Quint Int 1994; 24: 91-96. | 8. Tay NM, Lynch E,Auger D.Effect of some finishing techniques on cervical margins of porcelain laminates.Quint Int 1987;18(9): 599-602 | 9. Hedje RJ. Tooth fragment reattachment an aesthetic alterative. Report of a case. J Indian Soc Pedod Prev Dent 2004; 22: 54-55 | 10.Wadhwani CPK .A single visit, multidisciplinary approach to the management of traumatic tooth crown fracture.Br Dent J 2000;188: 593-598 | 11.Macedo GV, Diaz PI,Fernandes CA, Rilter AV.Reattachment of anterior teeth fragments. A conservative approach. J Esthet Restor Dent 2008;20: 5-20 | 12.Preeti Kore , Hugar SM,Kumar S.Reattachment of an autogenous tooth fragment in complicated crown fracture. World J of Dent 2011; 2(2) 135-138.