



ORIGINAL RESEARCH PAPER

Prosthodontics

REATTACHMENT OF FRACTURED CROWN FRAGMENT USING FIBRE POST

KEY WORDS:

Dr Arun Kumar KV

Associate Prof & Classified specialist (Prosthodontics)

ABSTRACT

Immediate restoration of fractured anterior tooth in the aesthetic zone to function and appearance not only reassures patient's confidence and also satisfying to treating dentist as it conserves the tooth structures and provides an opportunity to rebuild the coronal tooth structure to exact shape and size previous to injury. Advancements in composite resins and pre-fabricated post facilitates the ease of rehabilitation in a shortest period possible with longest prognosis

Introduction

Trauma due to fall commonly causes injury to front teeth and it accounts for 37% of the total teeth fractures [1]. Restoring these fractures back to function and appearance at the shortest time frame is a challenge as the psycho-social aspects of appearance takes the precedence. Rehabilitation of the fractured portion back to its earlier form, size and aesthetics requires detailed planning and meticulous execution. Traditionally these fractures are restored using direct or indirect restorative materials.[2] Even after the advancements of restorative science, developing the fractured tooth to its original form takes time and resources and has very less margin for errors.

Reattachment of preserved fractured portion back on the remaining tooth structure in the oral cavity provides easy tenable solution with certainty in achieving natural aesthetics, optical and mechanical properties to adjacent teeth. It also provides an immediate solution within the minimal time frame and restores individual's identity like before fracture of the teeth. In addition, it also provides psychological satisfaction for having his own tooth structure(fragment) used in the rehabilitation of his fractured tooth. This article presents a case which was rehabilitated by reattaching the fractured tooth fragment back to its function and appearance.

Clinical case

A 32-year-old male reported to the OPD with the history of a fall resulted in fractured front tooth an hour back. Impact of the fall was on his upper front tooth causing fracture of right lateral incisor and laceration on his upper lip. His vitals were normal and general physical examination revealed moderately built and nourished individual. Except laceration of the upper lip opposite to the fractured tooth, there was no injury on his extraoral structures noticed and TMJ function was normal. Intra-oral examination revealed satisfactory oral hygiene with Angle's Class I molar and incisor relation. Tooth no 12 was fractured at cervical region 01 mm coronal to gingival margin (Fig 1a). The fractured tooth was not restored or endodontically treated.No alveolar fracture or laceration of gingival tissues found. Involved teeth was tender and was neither mobile nor dislodged from its socket. Tooth no 11 was mildly tender with no clinical indication of fracture or mobility. IOPA radiograph of the fractured and adjacent teeth was made, which revealed no root fracture or any periodontal widening. The fractured fragment was kept and presented in a container filled with water and was in single piece (Fig 1b). Upon clinical and radiological examination, diagnosis of Ellis class 3 fracture of tooth no 12 was made. Treatment planning involved endodontic treatment, clinical crown lengthening, placement of post/Dowel and reattachment of fractured fragment using composite resin followed by full coverage all ceramic crown.

of fractured tooth was done with a sectional obturation to seal only apical third of the root canal (Fig 2 a). Using cautery, clinical crown lengthening was done by excising 1 mm of marginal gingiva to expose coronal tooth structure for preparation of bevel and bonding procedure. Fibre post of suitable size was selected after post space preparation and bonded to the radicular root canal space (Fig 1c). Pulp chamber of the fractured tooth fragment was cleaned and irrigated with sodium hypochlorite and conditioned with etchant and bonding agent. Length of the fibre post was adjusted to the available space of the pulp chamber of the fractured crown fragment. Fibre post was bonded to fractured fragments using composite resin taking into consideration of occlusion and alignment of adjacent dentition Fig 2b). Subsequently fibre splint was used to splint the restored tooth portion to the adjacent central incisor and canine to promote stabilisation and healing of the injured teeth. Patient was instructed to avoid hot food for first 24 hrs and avoid biting from front teeth for 4 weeks. Patient was prescribed with amoxicillin 500 mg T.i.d and Ibuprofen 400mg sos for 3 days. IOPA radiographs were made as a post op record. Patient was called after 24 hrs, 7days and after 4 weeks to evaluate and to reinforce oral hygiene measures. At 4th week of post op, fibre splint was removed and IOPA radiograph made to evaluate the periodontal structure. Periodontal structures were healthy and there was no bond failure at the reattached portion of the tooth (Fig 3a). All ceramic full coverage crown made of e-Max was provided to prevent fracture in future Fig 3b). Patient was advised to resume normal oral function and evaluated after a week. Tooth no 12 and periodontium around the tooth was normal. Patient was advised to get evaluated every month. After 03 months of post Op, treated tooth showed no abnormality and the patient had satisfactory oral function and appearance.

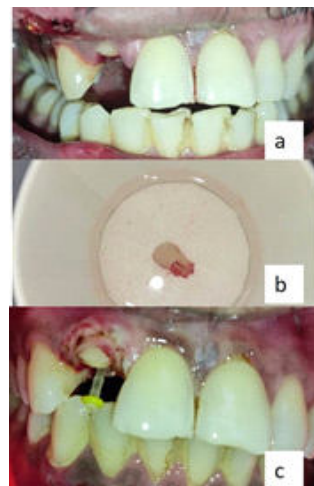


Fig 1 a, -Intraoral picture of fractured tooth no 12

Fig 1b- Fractured tooth fragment in a container containing saline

Fig 1 c- Crown lengthening followed by post attachment.

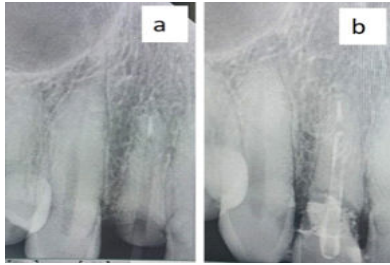


Fig 2 a,b depicts IOPA radiographs of fractured tooth no 12 with sectional obturation and fractured fragment attachment using fibre post and composite resin respectively



Fig 3a- Clinical intraoral picture of restored tooth no 12 after 24 hrs of treatment

Fig 3b- Tooth no 12 restored using e-max all ceramic crown

Discussion

Maxillary central and lateral incisors are among the commonest of the dental injuries involving anterior teeth [3]. As per Ellis & Davis classification of dental injuries, Extensive crown fracture with considerable loss of dentin and pulp exposure is considered as Ellis class 3 fracture. These fractures require endodontic treatment of involved teeth before restoration [4]. Restoration of these fractures is a daunting task as it involves restoring aesthetics and function at the earliest time possible. Even after the development of advanced restorative materials in the anterior tooth restoration, it is not easy to perfectly match physical and biological property of natural teeth to bring back function and aesthetics [5]. Reattachment of fracture fragment if available and preserved well could be the best conservative option in restoring the fractured crown portion. Basic criteria for bonding these fractured fragments are that there is no or negligible violation of the biological width, crown fragment is not mutilated and can be adopted to the fractured tooth [6]. It has the advantages of being conservative, best aesthetic match, similar wear properties as the adjacent dentition and elicits positive emotional response from patient [7]. Planning the retention of the fracture fragment is crucial for the long-term survival of the attachment. This can be achieved by mechanical and chemical interlocking. Use of fibre post anchored into the radicular portion and attaching the same to the pulp chamber of the fracture fragment using composite resin provides mechanical interlocking [8] and developing long bevel all along the fracture line of the tooth and the fracture fragment and bonding both using composite resin provides chemical bonding or interlocking of the fractured fragment. It may be essential to expose the radicular portion of the tooth by clinical crown lengthening which would provide enough tooth structure for bonding and to make the restored area self-cleansable. Even though reattachment of fractured fragment is a viable and conservative option,

patient needs to be educated about its limitation being a restored joint and any excessive oblique forces at the incisal edge may break the restorative joint. To enhance the clinical success, use of mouth guards and frequent evaluation may be required. It is some time advised to develop an extra coronal restoration which can splint the fractured tooth to that of the radicular tooth portion if the attached fragment detaches frequently [9].

Conclusion

This case report adopts conservative approach in restoring fractured anterior tooth fragment. Advancements in composite resin material and techniques enables us to follow minimally invasive methods in restoring traumatic front tooth in minimal possible time and resources and achieving best aesthetics possible without compromising on function. Hence, patients should be educated and encouraged to preserve any fractured tooth fragments and clinicians should consider reattachment of preserved fracture fragment as one of the option in restoring traumatic teeth.

REFERENCES

1. Dietschi D, Jacoby T, Dietschi JM, Schatz JP. Treatment of traumatic injuries in the front teeth: restorative aspects in crown fractures. *Pract Periodontics Aesthet Dent* 2000;12(8):751–8, quiz 760.
2. Andreasen FM, Norén JG, Andreasen JO, Engelhardt S, Lindh-Strömberg U. Long term survival of fragment bonding in the treatment of fractured crowns: a multicenter clinical study. *Quintessence Int.* 1995 Oct;26(10):669-81.
3. Macedo GV, Diaz PI, De O Fernandes CA, Ritter AV. Reattachment of anterior teeth fragments: a conservative approach. *J Esthet Restor Dent.* 2008;20(1):5-18;
4. Ellis E and Davey KW, *The Classification and Treatment of Injuries To The Teeth of Children*, Year Book Medical, Chicago, Ill, USA, 5th edition, 1970.
5. Alvares I, Sensi LG, Araujo EM Jr, Araujo E. Silicone index: an alternative approach for tooth fragment reattachment. *J Esthet Restor Dent.* 2007;19(5):240-5.
6. Macedo GV, Ritter AV. Essentials of rebonding tooth fragments for the best functional and esthetic outcomes. *Pediatr Dent.* 2009 Mar-Apr;31(2):110-6
7. Surya kumari NB, Sujana V, Ram Sunil CH, Reddy PS. Reattachment of complicated tooth fracture: An alternative approach. *Contemp Clin Dent* 2012;3:242-4.
8. Christensen CJ. Posts: necessary or unnecessary? *J Am Dent Assoc.* 1996 Oct;127(10):1522-4, 1526.
9. Andreasen FM, Noren JG, Andreasen JO, et al. Long term survival of fragment bonding in the treatment of fractured crowns. *Quintessence Int* 1995;26:669–81.