

A single visit, reattachment of fractured crown fragment

BASAVANNA RS, RAVI KAPUR, NEERAJ SHARMA

Abstract

“Minimal intervention with maximum dentistry” The immediate restorative technique resolving the acute problem of traumatic tooth fracture with pulpal involvement—An immediate fracture fragment reattachment using pre-fabricated fiber post with dual cure cement—A challenging, conservative, aesthetics, rehabilitating, functionally, and economically viable single visit procedure.

Keywords: Fragment reattachment, pre-fabricated fiber post, tooth fracture

Introduction

Crown fracture has been documented to account up to 92% of all traumatic injuries to the permanent dentition. The maxillary incisors are most commonly affected. The extent of the tissues involved in the traumatic injuries determines the management needs.

For fracture restricted to the crown with pulp involvement in anterior teeth, immediate reattachment of a dental fragment is a technique that should be considered.^[1]

Clinical Case

A 24-year-old male patient reported to the Department of Conservative-Dentistry and Endodontics, M.M. College of Dental Sciences and Research, Mullana, Haryana, India with the chief complaint of broken upper front tooth following trauma a day ago.

Initial examination revealed a green stick type of fracture with pulp exposure on the labial surface of maxillary right central incisor. The fracture was not evident palatally [Figure 1]. Left maxillary central incisor showed mesio-angular incisal chipping. Examination of soft tissues showed laceration of the lower lip.

Radiographic examination revealed an oblique fracture labio-palatally [Figure 2]. After routine history taking and examination, a treatment plan was formulated to immediately reattach the dental fragment of the teeth.

Technique

1. Local anesthesia was administered (Lignocaine 2%).

*Department of Conservative Dentistry and Endodontics,
M.M. College of Dental Sciences and Research, Mullana, Ambala,
Haryana, India.*

Correspondence: Dr. R.S. Basavanna,
Department of Conservative Dentistry and Endodontics,
M.M. College of Dental Sciences and Research, Mullana,
Ambala, Haryana, India. E-mail: revaplar@yahoo.com

2. The fracture segment was completely removed and preserved in physiological saline solution in order to prevent dehydration of the tooth fragment. A clean horizontal fracture, mesial to distal angulated incisally from labial to palatal was evident [Figure 3]. No caries or resorption defects were detected. [Figure 4]



Figure 1: Pre-operative photograph

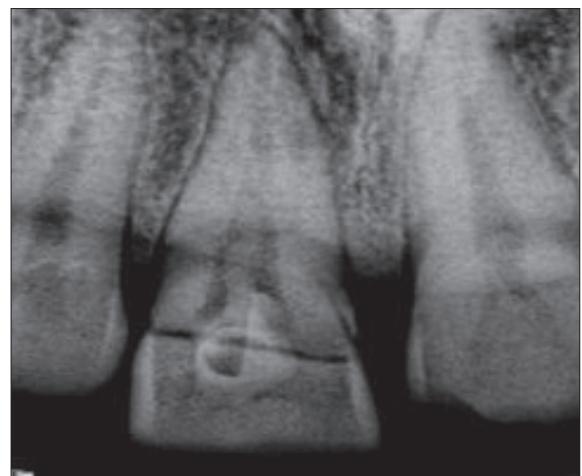


Figure 2: Pre-operative radiograph



Figure 3: Radiograph of sectional obturation with reattached segment

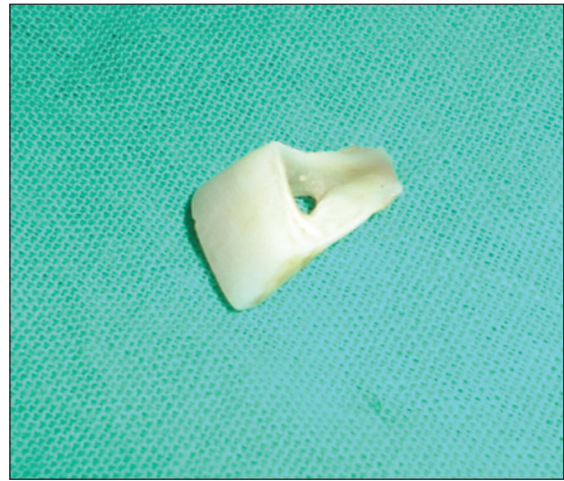


Figure 4: Fracture fragment

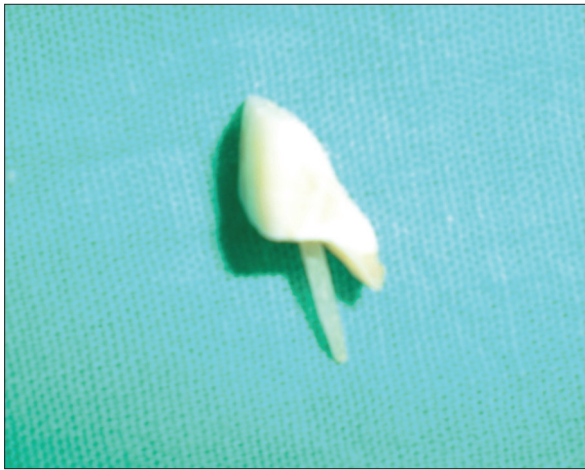


Figure 5: Single unit post and crown segment



Figure 6: Post-operative photograph

3. Sectional obturation was done with single visit root canal treatment. [Figure 3]
4. The root canal was then prepared with parapost drill, a corresponding pre-fabricated fiber post was selected for coronal fixation.
5. Preparatory alignment was done, by placing selected fiber post in to the canal and access prepared in the coronal tooth fragment to fit the post. Its bonding surface and pulp cavity was loaded with flowable composite to attach post, maintaining alignment with finger pressure until the composite set. [Figure 5]
6. After obtaining single unit, dual cure resin was placed in the canal, single unit post, and coronal segment was placed in to the canal. [Figure 6]
7. A radiograph was then recorded to confirm apposition of the two tooth portions.

Patient was recalled after 2 days. At the end of 2 days, the post-operative situation was uneventful.

Discussion

The uncomplicated traumatic injuries involving tooth fracture can be treated by reattachment of the tooth fragment using an adhesive system to provide what is considered to be the most conservative of restorations.^[2] Newer dentine bonding system work with such efficiency that they easily allow for normal masticatory forces. Survival rates for such restoration have been shown to be good, with failure often only resulting from subsequent trauma.^[3]

Fiber-reinforced posts are fabricated to bond with most resin cements and resin-based composite core materials. Successful bonding minimizes the wedging effect of post within the root canal, requires less dentin removal to accommodate a shorter and thinner post, and leads to lower susceptibility to tooth fracture.^[4]

Factors influencing the extent and feasibility of such repairs

include the site of fracture, size of fracture remnants, periodontal status, pulpal involvement, maturity of root formation, biological width invasion, occlusion, time, and resource of the patient.^[5]

Post-placement in addition to bonding, serves to retain the coronal portion via a friction bond, and assist in preventing dislodgement non-axial forces. The composite reinforcement technique together with this light-transmitting post had been widely used to functionally and esthetically restore compromised root filled teeth.^[6]

Adhesive post is used because it has potential for increased retention. It is more flexible and has modulus of elasticity approximately of the same (stiffness) as dentin. When bonded with resin cement it distributes forces evenly along the root.^[4]

The advantage of using original tooth fragment over all other materials includes color, morphology, translucency, physicochemical characteristics, patient acceptance, structurally conservative, and economical.^[7]

Treatment Options

1. Root extraction and prosthetic replacement, i.e., fixed, implant, removable.
2. Retention of the apical tooth portion and conventional conservation, e.g, periodontal correction if required, cast restoration.
3. Orthodontic extrusion, followed by restoration.
4. Surgical extrusion involving extraction then re-implantation and restoration.^[8]

However, many of the above techniques have associated limitations. These may include multi-visit appointments, cost, stabilization, and be less conservative in nature when compared with this case report.

In fracture involving two thirds of the crown extending subgingivally, invading the biological width, the repair of the

fracture includes- flap surgery with a slight ostectomy and endodontic treatment^[9].

Further, in some cases reattachment of a fractured tooth segment using dual cure resin allows the restoration of original tooth contour, colour and aesthetics^[10].

In this era of conservative, esthetic dentistry, the reattachment of fractured tooth segments has established itself as a realistic treatment option in the restoration of fractured teeth. It permits rapid restoration of original tooth contours and overall esthetics with greatly reduced chair time for both the patient and operator.

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