



RECONSTRUCTION AND RESURRECTION – A SECOND CHANCE?

A CASE REPORT

AUTHORS

Dr. P. Chitra, PG student

Dr. M. Kavitha MDS, Professor and HOD

Dept. Of Conservative Dentistry & Endodontics

Tamil Nadu Government Dental College & Hospital, Chennai.

INTRODUCTION

The mean prevalence of dental and oral injuries reported in the literature oscillated between 14% and 27% (7). A crown-root fracture is a type of dental trauma, usually resulting from horizontal impact, which involves enamel, dentin and cementum, occurs below the gingival margin and may be classified as complicated or uncomplicated, depending on whether pulp involvement is present or absent(1). Epidemiological statistics revealed that crown-root fractures represent 5% of dental injuries (2). To perform a coronal restoration it is necessary to reestablish the biological width so that margin of restoration can be placed appropriately without invading periodontal structures.(3)

Treatment options of a subgingival or intraosseous fracture include orthodontic or surgical extrusions, gingivectomy and osteotomy and intentional replantation.(9) Grossman in 1982 stated that Intentional Replantation , ‘ the act of deliberately removing a tooth and following examination, diagnosis, endodontic manipulation, and repair—returning the tooth to its original socket to correct an apparent clinical or radiographic endodontic failure.’ It is a one-stage treatment that would maintain the natural tooth esthetics if successful.

CASE REPORT

History and Examination

A 24 year old male patient reported to the Department with the chief complaint of severe pain and fractured upper front tooth due to trauma before 2 hours. Intraoral examination showed oblique fracture of middle third of the crown facially involving the enamel, dentin, pulp and extending subgingivally on the palatal aspect of 21(fig.1)and also an incomplete fracture line was seen in the midline of the crown in the incisal third of the labial surface. Fracture lines were not vivid on the palatal aspect of the crown in 21 (fig.3). Bleeding and severe tenderness were present while manipulating the fractured fragments in relation to 21. There were also evidence of fracture involving the enamel and dentin in relation to 22, 23. Pulp sensibility tests were non contributory.

Radiographic Examination

Intraoral periapical radiographic examination of 21 22 23 showed horizontal radiolucent line seen at the middle third of root in relation to 21.

Diagnosis

Complicated crown root fracture in 21 and uncomplicated crown fracture in 22, 23.



Fig 1



Fig 2

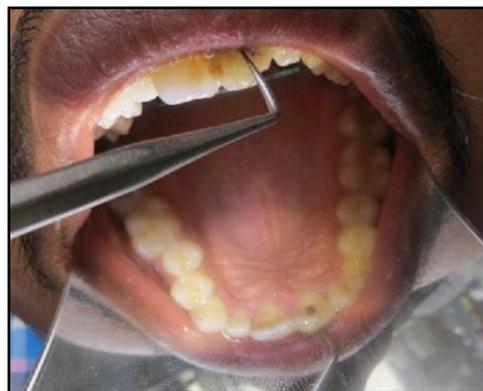


Fig 3

Treatment Plan

Complicated crown root fracture of 21

Root canal treatment of 21 → traumatic extraction → Reconstruction of fractured fragments-
 Intentional re-plantation → Post endo management of 21.

Uncomplicated crown fracture in 22, 23



Case of the Month – April 2017

Restoration of 22 with metal ceramic crown and 23 with light cure composite restoration.

Clinical procedure :

A written informed consent was obtained from the patient. Bleeding was controlled in relation to 21. The fractured fragments were stabilized using a flowable composite (Filtek™ Z350 XT Flowable Restorative- 3M India) on labial surface of 21. Root canal treatment was completed (fig.4). The tooth was then extracted atraumatically as a whole (fig.5-a, b) with care that the beaks of the extraction forceps did not go beyond the cemento-enamel junction (CEJ), as this might have damaged the cementum and the periodontal ligament. Upon examination, the fracture line extended through and through, splitting the tooth into two separate fragments. The patient was asked to bite lightly on sterile cotton until subsequent procedures were carried out. The fractured fragments were then reattached using self cure resin cement [Maxcem Elite™, Kerr dental, USA]. The root surface was minimally prepared using a small ¼ round diamond bur along the fracture line and was camouflaged with a thin mix of type IX GIC (GC GOLD LABEL 9). Post space preparation was done using Peazo reamer no. 3, retaining 6 mm of apical third of the obturation. The complete approximation of the tooth was assured clinically and radiographically (fig.6- a,b,c,d). The fibre post (RelyX™ Fiber Post-3M ESPE) was then luted using the self cure resin cement.

The tooth was carefully reinserted into its socket and brought into occlusion with digital manipulation and patient bite force. The tooth was stabilized in its socket with sutures and splinted with a suitable length of 40 lb nylon fishing line fitted to the labial surfaces of 13 to 23 (fig.7). Post operative oral hygiene instructions were given. The sutures were removed after 7 days. The patient was recalled after two weeks and the splint was removed. After one month, crown preparation was done in 21, 22 and restored with metal ceramic crowns (fig.8,9). Uncomplicated crown fracture in 23 was restored with light cure composite restoration (Te-Econom Plus-ivoclar vivadent, India). At 1 year follow up, the tooth was completely asymptomatic, radiographically sound and probing depth and mobility within normal physiological limits. (fig.10,11).



Fig 4

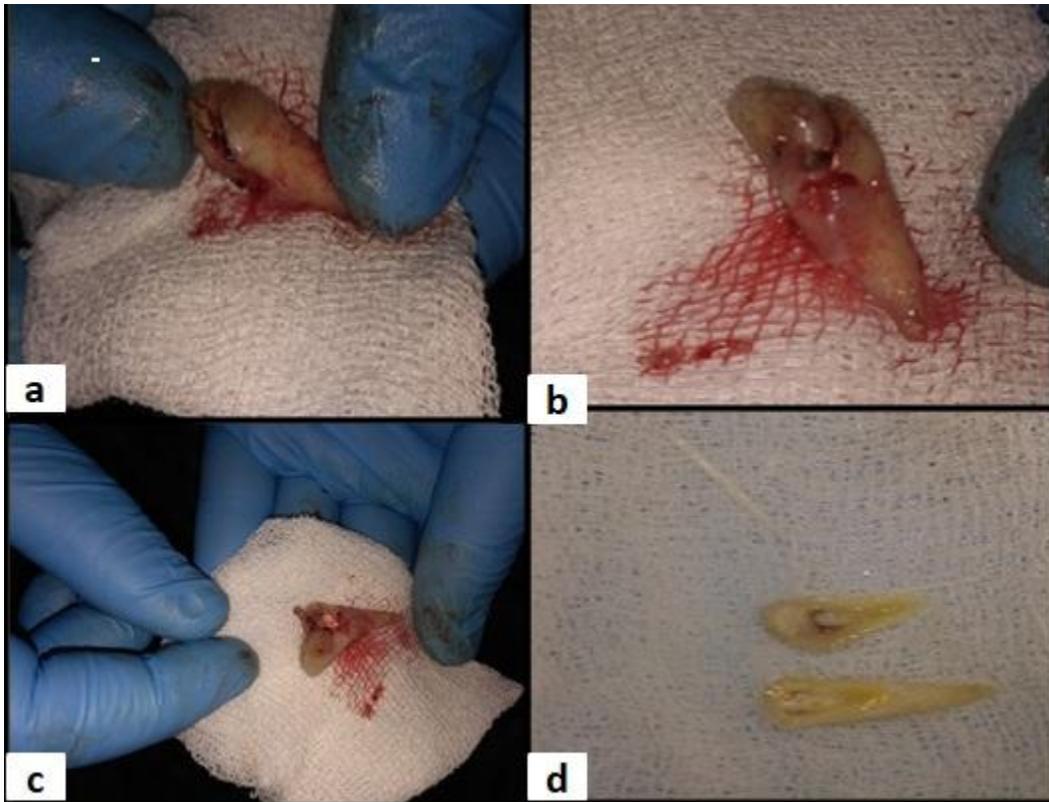


Fig 5

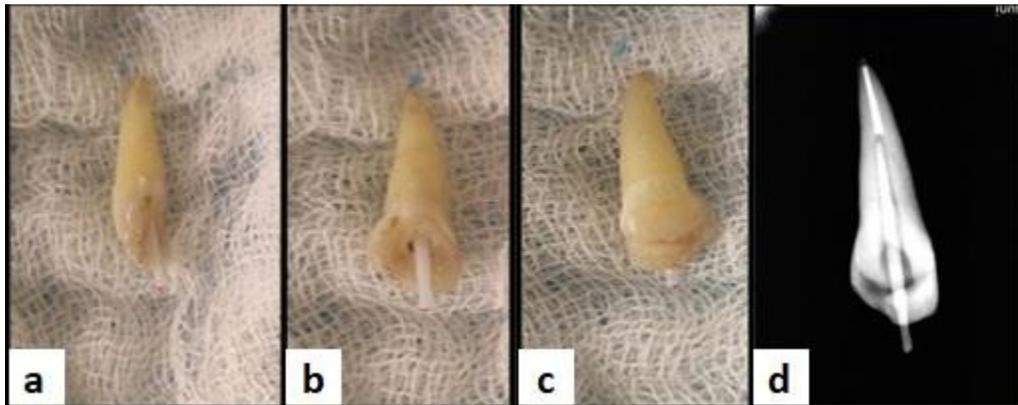


Fig 6

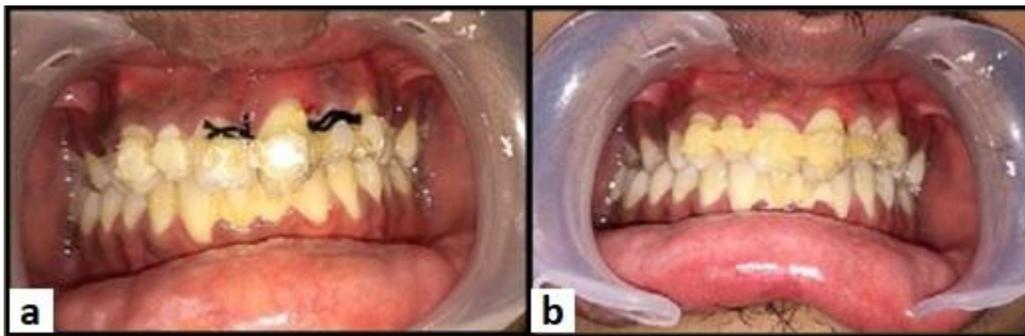


Fig 7

DISCUSSION

Traumatic dental injuries present a great challenge worldwide. Consequently, proper diagnosis, treatment planning and follow up are critical to assure favorable outcome(1). The main objective of the treatment consists in exposing the fracture margin to a supra gingival level, so that clinical restoration procedures can be conducted without contamination with blood and saliva. Due to the extent of the fracture line to the middle third of the anatomical root (fig.5), intentional replantaion was considered best choice for this case.

In order to provide the best long-term prognosis for a tooth that is to be replanted intentionally, the tooth must be kept out of the socket for the shortest period possible [3], and the extraction of the tooth should be atraumatic to minimise damage to the cementum and the periodontal ligament. Intraradicular splint was attempted with the fibre post which serves as a splint as well as helps to reinforce the coronal fragment . By using glass fiber post with recent advances in adhesive techniques and materials one can create a Monobloc, a multi-layered structure with no inherent weak interlayer interfaces [7]. TYPE IX GIC used to camouflage the fracture line provides good sealing ability (Vermeersch et al 2005), antibacterial effect and epithelial and connective tissue adherence (Dragoo et al 1999).



Fig 8



Fig 9



Fig 10



Fig 11

Conclusion:

The management of complicated crown root fractures in teeth is often more challenging with questionable prognosis and extraction of the tooth being the most common treatment option. However, conservative treatment options such as reconstruction of the fractured fragments with fibre post and dual cure resin followed by intentional replantation can be a viable treatment option for such teeth. But further long term follow up studies are needed to evaluate the same.

REFERENCES

1. DiAngelis et al, Guidelines for the Management of Traumatic Dental Injuries: 1. Fractures and Luxations of Permanent Teeth AMER ICAN ACADEMY O F PEDIATRIC D ENTISTRY ,2012, REFERENCE MANUAL V 3 7 / N O 6 1 5 / 16



Case of the Month – April 2017

2. Olsburgh et al, Crown fractures in the permanent dentition: pulpal and restorative considerations. *Dent Traumatol* 2002;18:103-115.
3. Rouhani et al, Intentional Replantation: A Procedure as a Last Resort. *J Contemp Dent Pract* 2011;12(6):486-492.
4. Liddelow et al, The restoration of traumatized teeth *Australian Dental Journal* 2016; 61:(1 Suppl): 107–119
5. Wang et al, Management of a complicated crown-root fracture in a young permanent incisor using intentional replantation. *Dent Traumatol* 2008;24:100-103.
6. Kahler et al, Splinting of teeth following trauma: a review and a new splinting recommendation *Australian Dental Journal* 2016; 61:(1 Suppl) 59–73
7. Shubha et al, Use of quartz fiber post for reattachment of complex crown root fractures: A 4-year follow-up *J Conserv Dent*. 2014 Jul-Aug; 17(4): 389–392