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Better Repair Than Restore: A case report

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Abstract
Anterior teeth trauma is considered a common occurrence. The management of a complicated tooth fracture is multi-factorial, Reattaching tooth fragment can be considered as a more conservative, cost effective, esthetic, less time consuming treatment option for restoring fractured tooth compared with resin based composite or a crown, also reattachment helps in maintaining tooth colour, wear resistance, morphology, and translucency in restoration. The current case report describes a multi-disciplinary approach for managing fractured maxillary lateral incisor that was treated, endodontically, followed by reattachment of the fractured fragment facilitated by surgical crown lengthening procedure.
Conclusion: *Reattachment of fractured fragment is an ultraconservative, safe and esthetic treatment modality that can be considered to manage a complex fracture of anterior teeth. The current case showcased the successful management of a fractured tooth with an Endo-Perio approach with a 6month follow up.*
Key Words: *Trauma, Fractured Tooth, Reattachment, Bonding, Crown lengthening*

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I. Introduction

Anterior teeth trauma is considered a common occurrence, often involving maxillary central and lateral incisiors due to the arch position.[1] Immediate attention is essential not only to restore function but also esthetics, as it can have a psychological impact on the patient.[2] Complicated fractures of the crown involving the enamel, dentin and the pulp contributes the most amongst the dental injuries and are mostly involving the maxillary incisors. The prevalence of trauma involving the maxillary incisors is estimated to be 37%.[3]

The management of a complicated tooth fracture is multi-factorial and is based on the extent or pattern of fracture, restorability, condition of the fractured fragment, occlusion, esthetics, prognosis, violation of the biologic width, and endodontic involvement.

Reattachment of the fractured fragment using acid-etch technique was first reported by Tennery and later Starkey and Simonsen reported similar cases.[4,5,6] Reattaching tooth fragment can be considered as a more conservative, cost effective, esthetic, less time consuming treatment option for restoring fractured tooth compared with resin based composite or a crown.[7] Reattachment also helps in maintaining tooth colour, wear resistance, morphology, and translucency in restoration. It has also shown a positive social and emotional response from the patient for retaining the natural tooth structure.[8] Reattachment has been made possible due to the development and improvements in adhesive techniques and restorative materials.[9]

The current case report describes a multi-disciplinary approach for managing fractured maxillary lateral incisor that was treated, endodontically, followed by reattachment of the fractured fragment facilitated by surgical crown lengthening procedure.

II. Case Report

A 33-year-old male patient reported to the Department of Conservative dentistry and endodontics, Yenepoya dental college with the chief complaint of cracked left maxillary lateral incisor. History revealed that the patient sustained the injury during a sports activity. Patient did not have pain. Intra-oral examination revealed fractured maxillary lateral incisor. Radiographic examination revealed the fracture line in the lateral incisor extending mesio-distally.

The treatment option suggested to the patient were (1)reattachment of the fractured fragment stabilized with fiber post, (2)exposure of fracture line and restoring with biodentine and restoration with fiber post followed by full coverage crown, (3)extraction followed by Implant, (4) Extraction followed FPD taking 21 and 23 as the abutment teeth. After the patient was explained of all advantages, disadvantages, prognosis and cost of all the treatment options available, patient opted for reattachment of fractured fragment stabilized with fiber post.

The site was anesthetized with 2% Lignocaine hydrochloride with adrenaline (1:80000) and isolated using rubber dam (Hygenic, Coltene Whaledent Inc., USA). Since the fracture involved the pulp, a single sitting root canal treatment followed by surgical crown lengthening procedure was performed as follows:

The #15 blade was used to give incision in the palatal aspect after which a full thickness flap was reflected using a periosteal elevator to expose the fracture line and the crest of the bone. The palatal alveolar crest was recontoured using a round tungsten carbide bur and chisel to gain access of the fracture line. The fractured fragment was subjected to acid etching using 37% orthophosphoric acid (3M ESPE) for 15s , then rinsed thoroughly using water and then blow dried with the three way syringe. Bonding agent (3M ESPE Adper) was applied on the etched surface and cured with visible LED light. The microhybrid composite (FiltekZ250 3M ESPE) was used along the fracture line and cured with visible LED light for 30s.

After the fractured fragment was reattached, the flap was replaced and sutured using 3-0 silk sutures using interrupted suturing technique. Antibiotics (C. Amoxicillin 500mg) and Analgesics (T. Paracetamol 650mg) were prescribed for 5days. Patient was recalled after 1week for suture removal. Healing was found to be satisfactory. After the sutures were removed, core build up along with post placement was done to reinforce the reattached fractured fragment.

6month follow up of the reattached tooth demonstrated a successful outcome of a fractured tooth in the anterior esthetic zone by reattaching the fractured fragment using resin composite reinforced with fiber post.

Fig1: Pre-Operative

Fig2: Pre-Operative Radiograph

Fig3(a)

Fig3(b)

Fig3(c)

Fig3(a-c): Single Sitting Root canal Treatment

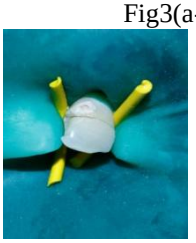

Fig4: Isolation using Rubber dam

Fig5: Acid Etching

Fig6(a): Buccal aspect

Fig6(b): Palatal aspect

Fig6(a): Post Reattachment

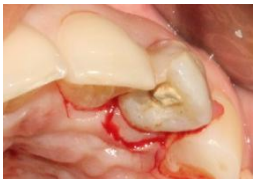

Fig7: Incision placed

Fig8: Flap reflected

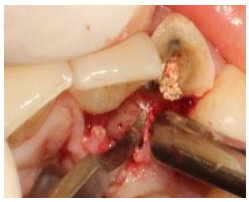

Fig9: Ostectomy performed with chisel

Fig10: After Complete visualization of Fracture line

Fig11(a): Buccal view

Fig11(b): Palatal View

Fig11: Sutures placed

Fig12: Post space preparation 1week post operatively

Fig13: Post space preparation radiograph

Fig14: Pre-Operative

Fig15: 2-weeks post-operative

Fig16: 6months post-operative

III. Discussion

Esthetic management of the traumatic injury of the anterior esthetic zone demands proper planning which should be based on sound knowledge of the techniques available and their indications, taking into consideration the risk benefit ratio.

The conventional management techniques utilized for restoring fractured teeth includes partial or full coverage crowns, laminates, veneers, and resin composite restorations, all of which are more time consuming, expensive and are comparatively less conservative than the reattachment technique.[3] The number of case reports suggesting that reattachment can be considered as a viable treatment option to manage complex tooth fracture is increasing. The current case report demonstrates the successful reattachment of fractured segment of maxillary lateral incisor with a 6-month follow-up.

The success of the treatment depends on various factors out of which hydration of the fractured segment outside the oral cavity is vital for maintaining the esthetic appearance of the tooth and to ensure adequate bond strength. [10]

The fracture line was extending subgingivally in the palatal aspect violating the biologic width, which was managed with surgical crown lengthening performed by raising a full thickness flap in the palatal aspect exposing the alveolar crest which was recontoured using a round tungsten carbide bur and a chisel until the fracture line was clearly visible. The post operative healing remained uneventful.

The advantages and disadvantages of the reattachment technique are to be considered for arriving at the choice of treatment of fractured tooth.[2]

Advantages are:

1. Rapid and conservative approach
2. Better esthetics
3. Rate of wear will be similar to adjacent teeth.
4. Positive emotional and social response from patient

Disadvantages are:
1. Colour change in reattached fragment
2. If dehydrated the tooth fragment renders a less esthetic outcome
3. Longevity is not known
4. Need for a constant monitoring

The advances in the adhesive system and resin composites have made reattachment of fractured tooth fragments not just as a provisional restoration but as a restorative option offering a favourable prognosis. However, Reattachment was possible in the current case since the fragment was intact.[11]

IV. Conclusion

Reattachment procedure may be regarded as an ultraconservative, safe and esthetic treatment modality that shall be considered to manage a complex fracture of anterior teeth. However, case selection for reattachment is vital to obtain a more favourable result. The current case showcased the successful management of a fractured tooth with an Endo-Perio approach with a 6month follow up demonstrating that it can be considered as a viable treatment option. Future studies to ascertain the success rate of the reattachment procedure is essential.

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