DECISION FOR PRECISION: AN INSIGHT ON MANAGEMENT OF DENTO-ALVEOLAR FRACTURE FOR AN AESTHETIC SMILE- A CASE REPORT

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INTRODUCTION

Traumatic injuries in young children and adolescents are a common problem that usually results from accidents, contact sports, falls, and violence. In the permanent dentition, the peak age of trauma incidenceis between 8 and 10 years, and the most commonly affected teeth are the maxillary central incisors followed by lateral incisors.[1]According to Anderson et al traumatic injuries are divided into six types of luxation and seven types of tooth fracture depending on the varying degree of tooth and the supporting structures involvement. The complexity of dental trauma is further increased by the possibility of combination injuries where the trauma has caused both a luxation and a fracture injury in the same tooth.[2]

Dento-alveolar fracture is defined as the trauma of the alveolar process, which may or may not involve alveolar sockets. It accounts to only 5.5% of all injuries. It's uncommon occurrence can be attributed to the different mechanisms of injury associated with these types of trauma.It is agreed that alveolar bone fracture are the result of a direct impact in an axial/lateral direction and the energy of this impact is transferred to PDL and alveolar bone.[3] The diagnosis of the alveolar

fracture depends on clinical and radiographic findings; the luxated teeth often have their crowns displaced palatally, which usually results in comminution or fracture of the labial alveolar bone and considerable injury to the periodontal ligaments. Although the dento-alveolar fracture can be clinically diagnosed, a radiographic examination must be done to determine the extent of fracture. Since the traumatic injuries are complex type of injury hence it is difficult to treat until diagnosed at the earliest followed by the proper treatment planning and implementation which will lead to ultimate successful outcome.[4]

This case report emphasizes on the management of severely traumatized teeth with immediate repositioning and endodontic treatment along with aesthetic correction.

CASE REPORT

A 26-year-old female patient reported with a chief complaint ofpain, displaced and missing upper front teeth which has happened on the previous day due to the fall from the motorcycle.There was no significant medical history but the intraoral examination revealed that segment containing 11, 12 was displaced palatally and was mobile. Avulsion i.r.t 21 was also evident but un-fourtunately she was not able to find it. Also, laceration of the lips and gum was noticed and she was unable to close the mouth. The right maxillary central and lateral incisors(11,12) was tender on percussion and generalized moderate fluorosis according to Dean's index was seen. Radiographic examination showed fracture of the labial alveolar bone with the roots of 11,12displaced buccally and the crowns displaced palatally. Hence a diagnosis,dento-alveolar fracture i.r.t 11,12 and avulsion i.r.t 21 was formulated. There are different treatment options available but the most conservative modality was chosen for the same. Repositioning and stabilization of the fractured segment using rigid splint along with immediate aesthetic, followed by endodontic treatment i.r.t 11 &12 and replacement of the missing tooth 21 with proper characterization was planned. The informed consent was obtained from the patient.

The immediate repositioning of the segment containing 11,12 under local anesthesia by finger manipulation followed by stabilization was done using a stainless steel arch wire of 19 gaugefor 4 weeks.The endodontic treatment for 11 &12 was initiated after 10 days. Cleaning and shaping was then performed using step-back technique, 3% sodium hypochlorite(Prime dental products)

and 17% EDTA (Prime dental products) were used alternatively with 23 G needle. Calcium hydroxide (RC Cal- Prime dental products) was given as inter-appointment medicament twice at the interval of 1 week. After 15 days, the canal was thoroughly rinsed with sodiumhypochloriteand saline and the obturation was done using the lateral compaction technique which was then sealed with composite resin. The splints were removed after 4 weeks and was checked for the stabilization. After oral prophylaxis bleaching was done in the lower anterior teeth to reduce the intensity of stains and suitable shade was recorded.Afterwhich, tooth preparation was done to receive a PFM crown i.r.t 12 and the fixed partial denture i.r.t 11,21,22. The artificial prosthesis was then fabricated in the lab with some surface characterization through the incorporation of stainsto simulate the natural appearance of teeth,which resulted in the replacement of the lost smile. Follow-up examination was done after 3 months which showed a satisfactory results.

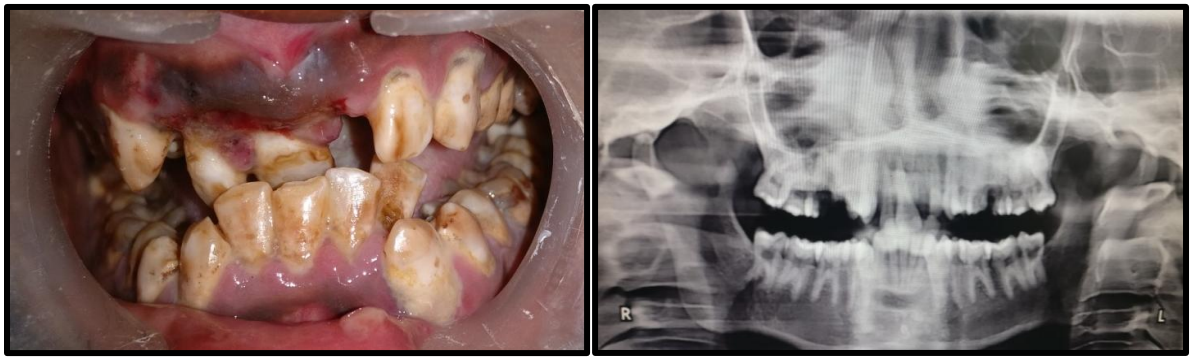

Fig 1 Pre-Operative Photograph & Radiograph

Fig 2: After repositioning and stabilization of the fractured segment

Fig 3: Post obturation radiograph

Fig 4: Clinical photograph after tooth preparation

Fig 5: Metal Try In

Fig 6: Post Operative Photograph

Fig 7: 3 month follow up Photograph and Radiograph

DISCUSSION

The epidemiology of dental trauma in adults according to Robertson et al., found that the most frequent dental injury to be coronal fractures (65-75%), followed by tooth luxation (8-20%) and dento-alveolar fracture (5.5%).[5]

The time interval elapsed since injury is very important because it influences the choice of treatment. According to Andreasen et al, repositioning of the dislocated teeth is more difficult after 48 h of the injury due to blood clot formation hence here in this case it was done after 24 hours.[1]In the present case scenerio, there were two biomechanical factors that appear to be a priority for optimized tissue healing.First, the healing of tooth-periodontal ligament (PDL)–bone interface and second, promotion of the healing interface achieved by stabilization of the tooth.[6]Also, it has been revealed through various clinical data thattraumatized teeth with isolated dento-alveolar fracture requires stabilization through rigid splints (Ebeleseder and Glockner 1995) for 4 weeks (Andreasan et al).Hence in the present case, rigid splint (orthodontic wire) was used to facilitate optimized healing.[7]Thereafter,GIC blocks were placed in the molars to disocclude the maxillary anterior teeth as the patient had deep bite which may possibly hamper the stabilisation.

The root canal opening and biomechanical preparation was initiated after 10 days as immediate opening is known to cause further trauma to the periodontal apparatus. Calcium hydroxide dressing was placed as an intra-canal medicament because it has an active influence on the local environment around a resorptive area by reducing osteoclastic activity and stimulating repair (Tronstad et al. 1981). This is directly related to the alkaline pH of $Ca(OH)_2$, which permeates through the dentine. (Estrela & Holland 2009).[8]

Occlusal interferences in centric and eccentric movements were checked clinically and no occlusal instability was evident. Hence, fixed partial denture (FPD) was planned for replacing the missing teeth and improving the aesthetics in the present case.[9]PFM prosthesis was chosen, as all ceramic restorations are contraindicated in deep overbite cases and stain duplication was then done on it for mimicking the surrounding natural teeth.[10]

CONCLUSION

Managing a patient with Dento-alveolar fracture requires not only professional skills but also empathy towards the patients and understanding the psychological trauma patient would have had. In the present case, timely management of the trauma along with adequate first-aid care contributed remarkably in allowing the re-establishment of esthetics, function, and patient's self-esteem.

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Case of the Month – May 2018

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I / We certify that I/we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the writing of the manuscript, to take public responsibility for it and have agreed to have my/our name listed as a contributor. I/we certify that all the data collected during the study is presented in this manuscript and no data from the case report has been or will be published by the editors, I/we will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, their assignees.

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