

Maxillary Left Lateral Incisor Fracture with Pulpal Involvement - A Case Report

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Abstract

Vigorous physical activities as well as competitive athletics offer sports men and women a variety of healthful benefits. However, participating in such activities also places athletes at risk for injury, including trauma to the teeth and mouth. These injuries are most often due to direct hits with a ball or player-to-player contacts. The goal of present paper discusses a case of a 17 year old hockey player who met with a sports injury and reported to the dental clinic with the chief complaint of broken upper front teeth. The paper discusses various treatment options available for different types of fractures to the teeth. Simple fracture involving enamel/dentin requires composite build ups but complex fractures involving pulp and extensive loss of tooth structure requires root canal treatment followed by post and core and crowning of the fractured tooth with porcelain fused to metal.

KEYWORDS: Post and core, Root Canal, Crown

Introduction

A good athlete will devote endless hours to help him perform at the highest level possible. Strength, fitness, flexibility & endurance are crucial to their specific sport. All the systems of body are brought to their peak levels and this involves the assistance of coaches, trainers, physicians, nutritionists and other health care professionals. The most neglected area is dental health. These athletes represent the highest level of physical development but their dental health is either at or below average level of the general population. There are many reasons for this. The financial costs of proper dental care are not a priority within the athlete's limited budget. Secondly, athletes have not been educated in this regard that is about importance of good dental health to their performance.

The most serious problem arises when an athlete is unable to perform due to pain or swelling from

dental crises. Even if they are not forced to withdraw, the trauma of an unexpected dental problem can severely affect the level at which athlete is able to train or compete. Valuable time is lost when dental injury occurs.

Dental injuries are a major problem for players from the pain stand point, esthetic standpoint and economics stand point *Andreasen et al (1994)*. Depending on the extent and the types of injury, some injuries can be managed at the sporting event site, with the athlete resuming play immediately. Other injuries may demand transfer to an urgent care setting and management by a specialist. Proper initial assessment and management of injuries may prevent unfavorable long-term results and permanent facial deformities. The ultimate goals are for the athletes to recover functionally and aesthetically from the facial injury and to return to competition in a timely manner *Ranalli (2002)*. Dental injuries are common incidents and timely and suitable

management of these occurrences is crucial for the prospects of the involved tooth. Although different entities require different treatment approaches, it is paramount to determine the time frame of the incident, the vitality of the affected tooth, as well as set up a proper follow up scenario.

Case Report

A 17 year old athletic player reported to the clinics of Dr.H.S.Judge Institute of Dental Sciences Panjab Univeresity Chandigarh with a chief complaint of broken upper front teeth while playing hockey. Clinical and radiographic examinations were conducted. Clinical examination revealed fracture in the middle third of the crown of the maxillary left lateral incisor, exposing the pulp along with incisal fracture of maxillary right and left central incisor (Figure 1). There was no mobility or displacement. The remaining maxillary and mandibular anterior teeth were intact. Periapical radiograph was taken which confirmed pulpal involvement of maxillary left lateral incisor where as there was enamel /dentin fracture of left and right central incisors with no pulpal involvement. (Figure 2)

Treatment plan was divided into two parts

- (1) Treatment for left and right central incisor with enamel /dentin fracture:
- (2) Treatment for left lateral incisor with enamel/dentin /pulp fracture

(1) The treatment plan for left and right central incisors with enamel/dentin fracture was done by restoring them with composite restorations. Prior to giving composite restoration shade selection was done for better results. Shade guides was

used under proper natural light. The fractured surfaces of the tooth were prepared. Under rubber dam isolation etchant (phosphoric acid) was applied to the fractured surfaces for 15 seconds, washed, dried, and then bonding agent was applied. The restorative procedure was finished by incremental build up of composite. Finally the composite restoration was polished with composite polishing kit. (Figure 6)

- (2) The treatment plan for left lateral incisor with pulal involvement was divided into

Step 1- endodontic phase

Step 2- adjustment of the post.

Step -3: Crown cutting of the restored tooth

Step 1: The Endodontic Phase

An infraorbital block was administered for left maxillary lateral incisor. The pulp chamber was opened using no.330 round carbide steel bur & working length determination IOPA was taken with a no. 10 K-file (Figure 3) .The pulp tissue was extirpated using no.10 – no.60 K-files. After irrigation with copious amounts of 2.5% NaOCl & Normal Saline, the root canal was dried using paper points. A thin mix of Zinc oxide eugenol paste was mixed and G.P points were coated with Zinc oxide eugenol paste and filled in the canal (Figure 4).

Step -2: Adjustment of post

The post space was prepared 1 week after the endodontic treatment was completed. The post space was created by

removing approximately 4mm of gutta percha points using gutta percha solvent. A prefabricated post was taken and inserted into the canal space to check for its proper adaptation. A periapical radiograph was taken which ensured that there was a minimum of 4 mm of gutta percha left in place to protect the apical seal and there was no gap between the post and the filling beneath. (Figure 5)

A total etch technique was used to bond the post and core. The prepared post space was then cleaned with saline, air- dried & acid – etched with 37% phosphoric acid for 15 seconds. This space was rinsed and air dried with oil-free compressed air. A light cured bonding agent was brushed on the etched surface & uniformly dispersed by a compressed air blast. It was then light cured with for 20 seconds. The prefabricated post was then cured for 20 seconds in order to gain rigidity, before insertion into the post space. Light cured flowable composite resin was then inserted into the canal chamber after which the post was inserted. The post & composite were then cured together for 60 seconds.

The coronal enamel was then etched for 20 seconds, rinsed with water & air dried followed by application of bonding agent – which was then light cured. The coronal post was then covered with the flowable composite for core build –up, followed by light curing it for 60 seconds and finally teeth were restored with hybrid composite .The final finishing & polishing was done with finishing burs. Occlusal interferences in normal & paranormal mandibular movements were removed.

Step -3: Crown cutting of the restored tooth

After root canal treatment and post adjustment of the fractured tooth, crown cutting of the teeth was done as shown in (Figure 5). After the crown cutting impression was taken and sent to the lab for the processing of Porcelain fused to metal for the processing of Porcelain fused to metal crown. The crown was fixed with the help of luting cement i.e GIC TYPE 1 as shown in the (Figure 6).



Figure 1: fracture in the middle third of maxillary left lateral incisor along with incisal fracture of maxillary right and left central incisor



Figure 2: Periapical radiograph showing pulp involvement of maxillary left lateral incisor where as enamel /dentin fracture of left and right central incisors with no pulp involvement



Figure 3: Working length X-ray of left lateral incisor taken



FIGURE 4: IOPA showing obturation of left lateral incisor



FIGURE 5: IOPA showing prefabricated post adjustment



FIGURE 6: Final photograph of the patient with composite build ups in left and right central incisor and crown placement in left lateral incisor

The paper discusses various treatment options available for different types of fractures to the teeth. Simple fracture involving enamel/dentin requires composite build ups but complex fractures involving pulp and extensive loss of tooth structure requires root canal treatment followed by post and core and crowning of the fractured tooth with porcelain fused to metal.

When there is severe loss of coronal tooth structure, the use of posts placed inside the canal after endodontic treatment will give retention, provide stability to the reconstructed crown, and withstand masticatory forces in function *Mouradian (2001)*.

The objective of a post and core buildup is primarily to replace missing coronal tooth structure sufficiently to provide adequate retention and resistance for the crown that will eventually restore the function and esthetics of the tooth *Freedman (2002)*. There are a variety of root posts used in dentistry A resin composite post building up directly, resin composite short post placement, alpha or omega shaped orthodontic wires, stainless steel pre fabricated posts, nickel-chromium cast posts with macro retentive elements, natural teeth from a tooth bank or reinforced fibers. Prefabricated posts are fast, cheap and easy to use; therefore they are the most widely used posts in the dental clinics.

Hence, this paper helps to develop dental trauma management awareness in sportspersons which can help deal with everyday teeth trauma in most appropriate way

Conclusion

Discussion

In conclusion, the study discusses various treatment options available for different types of fractures to the teeth. The paper also enlightens the sportsperson to deal with dental trauma met by them while playing games.

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