MANAGEMENT OF ACUTE DENTAL TRAUMA - FRAGMENT REATTACHMENT

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ABSTRACT

Trauma to anterior teeth is relatively common among children and teenagers. It has been estimated that approximately one quarter of the population under the age of 18 years sustain traumatic injury in the form of anterior crown fracture. Reattachment of a fractured fragment to the remaining tooth can provide esthetically pleasing results provided that the fragment is available. In this clinical report we have presented a case in which the fractured fragment of the tooth was retrieved from the upper lip and reattached in the same appointment.

Key words: Trauma, Central Incisor, Fragment reattachment.

INTRODUCTION

We have different modalities to prevent dental caries, malocclusion and periodontal disease, but our ability to prevent trauma to the oro-facial structures is limited. Few children reach 4 years of age without having received a blow to the mouth. It has been estimated that 1 out of every 4 persons under the age of 18 will sustain a traumatic dental injury in the form of an anterior crown fracture. Many accidents that affect the primary dentition occur during the first 3 years. During this period only the child moves from a state of total dependence with respect to movement to one of independence as he or she learns to situp, kneel, stand, walk and run. The majority of injuries to the mixed and permanent dentition result from minor fall accident while participating in sports or childish pranks which were not intended to harm, produce the greatest number of fracture and displacement in children.

Trauma to permanent anterior teeth resulting in a fracture of central incisor is a tragic experience for the child as well as the parent, which present a challenge for the dentist. This situation must be corrected to relieve the psychological trauma to the child as being different from other children. Slack and Jones observed that progress of children in school and their psychological well being, can be adversely influenced by an injury to the teeth that causes an unsightly fracture. Apart from the psychological trauma injuries to the teeth of children presents unique problems in diagnosis and treatment. The diagnosis of the extent of injury after a blow to a tooth regardless of loss of tooth structure is difficult and often inconclusive. Prognosis of the involved tooth is uncertain. The success of treatment often depends on the rapidity with which the treatment is provided.

Pediatric dentists reported the first published case of reattachment of a fractured incisor fragment in 1964 at Hebrew University, Hadassah School of Dentistry. Since then numerous reports have been reported by various authors worldwide. Now the literature is replete with descriptions of clinical techniques, preparation designs and resistance /retentive features.
that have been used to manage the traumatic incisal edge fractures.

Occasionally part of a fractured tooth may enter and be retained in the lip\textsuperscript{12}. The direction of impact, prominence of anterior teeth and length and position of the lip at the time of injury determine which lip will be involved. When a patient has a swollen lip and dental trauma to the anterior dentition, one should always suspect embedded tooth fragments. A soft tissue radiograph will confirm the diagnosis. The following case describes the comprehensive diagnosis and management of a child with trauma to the maxillary anterior dentition in which radiographic examination of the lip disclosed the fractured tooth structure. The fractured fragment was retrieved and reattached in the same appointment.

**CASE REPORT**

A 10 year old boy presented to the dental office with a fractured left permanent central incisor. The fracture was a result of a fall in his house 2 hours before, when questioned about any history of headache, convulsions, loss of consciousness or vomiting, he answered in the negative. Clinical examination was conducted after the teeth and the soft tissues surrounding it were carefully cleaned of debris. Initially the soft tissues were examined, a penetrating lip lesion in the upper lip was found. On examination of the hard tissues a fractured left permanent central incisor (Class \textbf{III} Ellis) was found with a large pulp exposure (Fig 1). The bright red colour of the exposed pulp indicated an intact circulation (Fig 2). When questioned about the fractured fragment patient was not certain whether it is lost or inside the upper lip. Keeping in mind the penetrating lip lesion of the upper lip a soft tissue radiograph was taken. The fractured fragment was seen in the radiograph. A periapical radiograph was taken which revealed a closed apex. The following factors helped us in determining the treatment plan:

1. Time elapsed since trauma (2 hours)
2. Intact pulpal circulation (Bright red pulp)
3. Fractured fragment inside the upper lip

We completed the fragment reattachment procedure as mentioned below. After administering local anesthesia (Infiltration - lignocaine 2% with adrenaline) the anterior teeth were isolated with small cotton rolls. The fractured fragment was retrieved from the upper lip (Fig 3) and washed thoroughly and stored in saline. The exposed pulp was washed with saline and covered with a layer of calcium hydroxide (dycal). Beveling of the fractured margin of the tooth and the fragment was done with a diamond bur. Both the fractured end and the fragment was acid etched with a phosphoric acid gel for 30 seconds. While the operator was rinsing the acid from the tooth, the dental assistant etched and rinsed the fragment. After gentle air drying a dentin bonding agent (All bond 2) was applied.
DISCUSSION

With the advancements in technology and biomaterials it is now possible to achieve excellent results both esthetically and functionally by fragment reattachment procedure. Tennery has reported successful reattachment of tooth fragment for 8 teeth in five patients. Starkey has reported successful reattachment of one tooth fragment on a lower central incisor 2 days after the injury. Simonsen (1979, 1982) has suggested that beveling the fractured enamel margins of both the tooth and the fragment before reattachment should produce an improved restoration. Dean Avery and Swartz have demonstrated in vitro that enamel beveling are no more retentive than reattached fragments with no beveling at all. Ludlow and LaTumo have reported a case in which the entire clinical crown was reattached.

CONCLUSION

Fragment reattachment procedure has the following advantages

1. Atraumatic and ideal method
2. Esthetically restoring natural colour and contour
3. Favorable wear mechanism
4. Continuous monitoring of pulp status through the fragment
5. Economical (One visit treatment)

This is a highly conservative treatment, other treatment options still remain open.

In the presence of a penetrating lip lesion, a soft tissue radiograph is indicated in order to locate eventual foreign bodies. It should be noted that the orbicularis oris muscle close tightly around foreign bodies in the lip, making them impossible to palpate and they can only be identified radiographically. This is accomplished by placing a dental film between the lips and the dental arch and using 25% of the normal exposure time. Evaluation of pulp integrity following crown fracture can be done by observing the color of the exposed pulp. The cyanotic exposed (dark blue) pulp of a traumatised incisor reflects a compromised circulation whereas a bright red colour exposed pulp reflects intact circulation. The fractured fragment can be fastened to a...
piece of sticky wax to facilitate handling the small fragment.

If the dentist believes that he or she is not equipped to handle the emergency a referral to a specialist if available should be made. The child is of prime importance because not only the teeth be involved but also child’s entire self image. Since, time is such an important consideration in the treatment of fracture or displacement every effort should be made to see the patient in the office immediately. Even if it means delaying scheduled appointment, the injured child should be given preference and emergency treatment should be rendered. Every possible attempt should be made to preserve the vitality of traumatised tooth whenever possible. After all a natural tooth is a natural tooth.

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REFERENCES