

SURGICAL EXPOSURE OF UN-ERUPTED TEETH FOR ORTHODONTICS

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Abstract

This paper has described a case of unerupted teeth. It is important to treat an impacted tooth in order to prevent the improper eruption of nearby teeth, cyst formation, possible infection or other negative changes in the jaw. Higher susceptibility of plaque accumulation in patients undergoing orthodontic treatment makes involvement of periodontist almost unavoidable. Also, orthodontic treatment frequently results in undesirable periodontal changes which require immediate attention. More recently, orthodontics has been used as an adjunct to periodontics to increase connective tissue support and alveolar bone height.

Key words: - Delayed Eruption, Mucoperiosteal Flat, Orthodontic Tooth Movement

Introduction

Delayed eruption of a permanent tooth is a significant concern. This report describes the orthodontic management of a case in which unerupted teeth were guided into occlusion. An impacted tooth is one that is embedded in the alveolus so that its eruption is prevented or the tooth is locked in position by bone or the adjacent teeth. This means it is buried under bone and gum tissues and visible on the x-rays but not in the mouth. In order for the orthodontist to properly move the impacted tooth into its rightful space, the periodontist needs to surgically uncover the tooth so that an orthodontic bracket can be placed and the tooth can be moved into place. Orthodontic treatment aims at providing an acceptable functional and aesthetic occlusion with appropriate tooth movements. These movements are strongly related to interactions of teeth with their supportive periodontal tissues.

Case Report

A 18-year-old boy presented with a chief complaint of missing teeth. His medical and dental histories were non-contributory and the family history did not reveal any evidence of hereditary dental anomalies. Clinical examination revealed orthognathic facial profile and exhibited good facial balance in all proportions. An oral examination revealed missing teeth. (Figure 1)



Figure 1: - Showing missing teeth.

Treatment

The procedure which was chosen was a closed technique. After adequate anesthesia was obtained using block and infiltration injection of 2% lidocaine with 1:100,000 epinephrine, a full-thickness mucoperiosteal flap was raised

giving crestal incision. The flap was elevated and retracted, and bone overlying the crown of the teeth were removed using a surgical bur and copious irrigation with normal saline. Once adequate clinical crown was exposed, hemostasis was achieved by applying direct pressure with sterile gauze and cotton pellets. (Figure 2)



Figure 2: - Showing mucoperiosteal flap raised.

Once hemorrhage was controlled, the tooth surface was isolated, etched with 50% phosphoric acid, rinsed with water, and dried. (Figure 3)



Figure 3: - Application of etchant.

The appliance used to apply traction to the teeth consisted of an orthodontic bracket and ligature wire. The bracket then was directly bonded to the etched tooth surface. The ligature wire was passed into the bracket (Figure 4) and the flap repositioned and closed primarily with sutures. Only the orthodontic wire was visible through the gums while the tooth was guided to its proper position. (Figure 5)

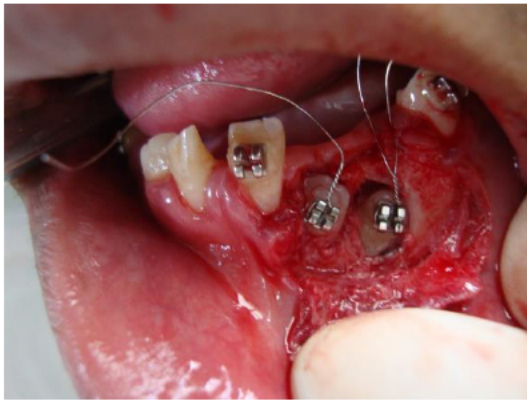


Figure 4: - Placement of orthodontic brackets and ligature wire.



Figure 5: - Suturing done exposing the ligature wire.

The patient was given oral hygiene instructions that included chlorhexidine rinsing of the mouth for seven days, but no tooth-brushing. One week later, sutures were removed and the area evaluated. Clinical examination revealed a favorable response, the absence of bleeding and inflammation. Mechanical tooth-brushing was reinstated one week after the surgery.

Outcome and Follow - Up

Patient was recalled for follow-up after 3 and 6 months. On follow-up visits, patient was asymptomatic. The patient was followed up by his orthodontist to bring the unerupted teeth into proper occlusion.



Figure 6: - Teeth guided into occlusion.

Discussion

One of the most common orthodontic problems requiring surgery is the delayed eruption of a permanent tooth. The treatment of an unerupted tooth will depend on its state, position and if there is enough space in the dental arch to accommodate.¹ If eruption has been delayed, the permanent tooth should be exposed, because it is important to allow the tooth to erupt into correct position as soon as possible. Eruption of a tooth is considered to be delayed (i.e., the tooth is impacted) when all of the following conditions exists:

- The normal time for eruption has been exceeded.
- The tooth is not present in the dental arch and shows no potential for eruption.
- The root of the unerupted tooth is completely formed.
- The homologous tooth has been erupted for at least 6 months.

Other than the third molars, the maxillary canines, maxillary central incisors and mandibular second premolars are the teeth that most commonly become impacted.²

Impacted teeth present many problems for the orthodontist. They can compromise tooth movement, esthetics, and functional outcomes.³ The incidence of mandibular canine impaction is much lower at only about 0.35 percentage. In the mandibular arch, the second most commonly impacted tooth after the third molar is the second premolar, followed by the second molar.⁴

An impacted tooth is a tooth that fails to fully pass through the gum tissues and/or bone. This can occur due to the presence of dense soft tissue, bone, or tooth malposition, cysts, or another tooth. If a tooth fails to emerge, or emerges only partially, it is considered to be impacted. Despite the success of extraction and implant replacement a combined orthodontic and periodontal approach that attempts to preserve the natural tooth has many advantages as well as intangible value to the patient.⁵

A study by Lang and Loe (1972) demonstrated that although tooth surfaces may be kept free of clinically detectable plaque, areas with less than two millimeters of keratinized gingiva tend to remain inflamed.⁶ The study proposed that a movable gingival margin would facilitate the introduction of microorganisms into the gingival crevice, resulting in a thin subgingival bacterial plaque that would be difficult to detect and not easily removed by conventional tooth-brushing. The gingival integrity is augmented by creating a band of keratinized gingiva.

During orthodontic treatment, it is particularly important to maintain a healthy band of keratinized gingiva around a labially positioned teeth. Otherwise, the mobile tissue around the tooth may strip away from the crown and root surface, leaving a periodontal defect.

According to Proffit, there are three categories of problems when dealing with an impacted tooth: Surgical exposure, attachment to the tooth, and orthodontic mechanics to bring the tooth into the arch.⁷

Bishara advocated surgical exposure of the impacted canine with no orthodontic traction only when the tooth has a correct axial inclination. Surgically exposed teeth rarely erupt into a created space without aid, especially once root formation is complete. Removing smaller amounts of overlying bone during surgery results in reduced bone loss after orthodontic treatment. The exposed tooth remained periodontally healthy with proper handling of the soft tissues during the surgical phase and proper postoperative oral hygiene practices.⁸

Many methods of attaching “hardware” to teeth have been described. Wire ligatures were originally placed around the crown of the impacted tooth, but this had the potential to upset the periodontal attachment.

Boyd compared wire ligation to bonding brackets on impacted canines. In general, wire-ligated teeth had a greater incidence of noneruption, ankylosis, external root resorption, and loss of attached mucosa due to larger flaps required.⁹

Ideally, mechanical traction should be activated immediately after surgery, and force should be applied to an existing fixed or removable appliance. Other techniques to guide eruption include: Special alignment springs called Ballista springs, coil springs, power chains, or loops of ligature wire extending from the canine to the arch wire.¹⁰

This case report shows the use of a surgical procedure for uncovering unerupted teeth, which when used judiciously, gives excellent results and helps in preventing future mucogingival problems. Future studies are required to evaluate the long-term efficiency of such procedures. This requires a coordinated approach on the part of both the periodontist and the orthodontist, which would ultimately benefit the patient in maintaining a trouble-free periodontium.

Conclusion

Patient education, motivation, enhanced oral hygiene maintenance and regular periodontal care are essential during orthodontic treatment. Certain adjunctive periodontal procedures may help an orthodontist achieve more stable and esthetically acceptable results. Close cooperation between the periodontist and orthodontist can ensure excellent results with long-term stability.

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