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Case Report

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Surgical Exposure And Orthodontic Treatment Of Bilaterally Impacted Permanent Maxillary Central Incisors: A Case Report

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Abstract
This paper describes the alignment of impacted maxillary central incisors positioned high in the vestibule and removal of two Mesiodens, in a 12 year old boy, by a combined surgical and orthodontic approach. Many treatment alternatives are available for these cases, but the one with the best long-term prognosis appears to be the surgical exposure and direct orthodontic traction rather than auto-transplantation, or excision of mucosa and packing of the defect.

Key Words
Impacted Teeth, Maxillary Central Incisor, Impacted Mesiodens

Introduction

Impacted teeth are common findings among patients visiting the dental clinic. A substantial number of these teeth are indicated for surgical removal since they may be the cause of infection, pain or cyst formation.[1] Third molar is the most common tooth to be impacted followed by the maxillary cuspid, the upper and lower bicuspid and central incisor next in frequency. The central incisor is the most frequently retained incisor. The frequency of maxillary incisor impaction ranges from 0.06% to 0.2%.[2] Their origins include various local causes, such as odontoma, supernumerary teeth, and space loss.

Impactions caused by disturbances in the eruption path related to crowding are somewhat less common. Other causes are crown or root malformation of permanent incisors due to trauma transmitted from the primary predecessors and apical follicular cysts that prevent normal eruption.[3] An anomaly in the eruption of anterior teeth can interfere with facial aesthetics and cause other clinical problems.

Several techniques[4] have been developed as a choice of treatment for this scenario. If the impacted tooth is extracted, loss of alveolar bone is anticipated. Following the healing period, the alveolar ridge becomes thinner and deficient. With these disadvantages in mind, orthodontic treatment to facilitate eruption of the natural tooth and maintaining natural appearance are the goals of treatment. As a result, surgical and orthodontic treatment approaches are accepted for such impacted teeth.

The surgical exposure and orthodontic traction of bilaterally impacted central incisors after removal of impacted supernumerary teeth is presented in this report.

Case Description

A boy aged twelve years presented with a chief complaint of missing both upper central incisors. The child was in good health and had no history of medical or dental trauma. His medical history was non contributory.

Intraoral examination revealed missing permanent central incisors with permanent dentition. **(Figure 1)** The Intraoral periapical radiograph demonstrated both maxillary central incisors were impacted along with the presence of two impacted supernumerary teeth **(Figure 2)**. SLOB Technique suggested the presence of Mesiodens palatally.

The treatment plan consisted of extraction of the supernumerary teeth followed by surgical exposure, traction of the impacted central incisors, and fixed orthodontic treatment.

Bonding and banding were done on the maxillary teeth. **(Figure 3)** Local anesthesia was administered using Lignocaine Hydrochloride 2% with adrenaline. A palatal mucoperiosteal flap was raised to remove supernumerary teeth.**(Figure4, 5)** After removal of the supernumerary teeth, Labial mucoperiosteal flap was raised to expose incisors. Pre-ligatured brackets were bonded to the labial surface of the

Fig 1. : Intra Oral View Showing Missing Permanent Maxillary Central Incisors

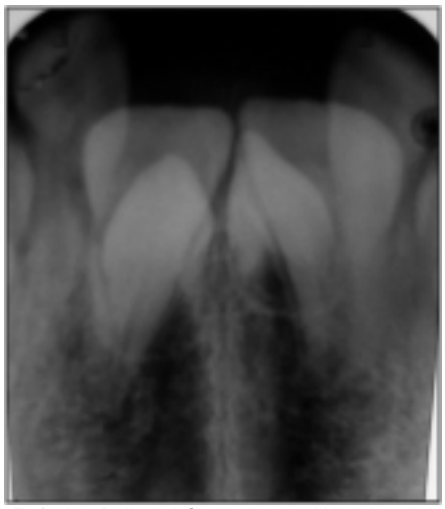

Fig 2. : Iopa Radiograph Showing Impacted Mesiodens And Central Incisors

impacted incisors and flap sutured **(Figure 6)**. Ligature wire was tied to the arch wire and a light force was applied.**(Figure 7)**

After one month, 11 started appearing. When the incisors started appearing in the oral cavity slightly above the occlusal plane, the NiTi arch wire was directly attached to the brackets.**(Figure 8)** The patient was given maxillary expansion plate so as to create space for the erupting 21 **(Figure 9)**. After about 15 days, desired position of incisors was achieved**(Figure 10)**. Hawley retainer with instructions for initial full-time wear and then long-term night time wear was given. Total treatment time was 18 months.

Results

The maxillary central incisors were brought into an acceptable position within the arch. Adequate overbite and overjet were achieved. The most significant change was a dramatic improvement in the patient's smile, and the final appearance of the teeth with gingival margins at the same level and similar clinical crown sizes.

Discussion

Impacted teeth can cause serious dental and aesthetic difficulties as well as psychological problems especially in anterior regions.

Treatment of unerupted impacted teeth may utilize methods from both surgical and orthodontic specialties.[4] Teeth, other than the third molar, when impacted have different ways of treatment. These include either no treatment, exposure of the tooth and packing of the wound to prevent re- epithelialization, or removal when it is in an unfavorable position. When the tooth is high in the arch and causing some adjacent root resorption and other pathological changes, transplantation involving bodily removal from the site of impaction to the correct position within the line of the arch is performed.[5]

Several approaches are described in the literature.[6], [7] One of the methods available for treating an impacted tooth is surgical exposure followed by orthodontic traction. The technique used in this case was surgical exposure and attachment of a preligatured bracket to forcefully move the tooth into occlusion simulating the force of eruption.

Impaction of maxillary anterior teeth can be a challenging orthodontic problem.

Fig 3. : Banding And Bonding Done On Maxillary Teeth

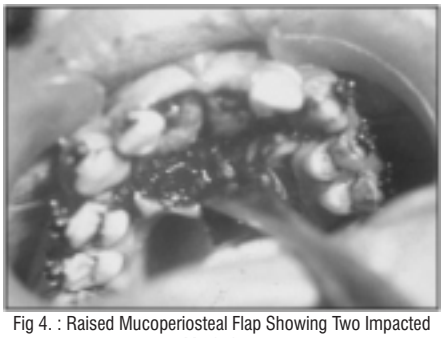

Fig 4. : Raised Mucoperiosteal Flap Showing Two Impacted Mesiodens

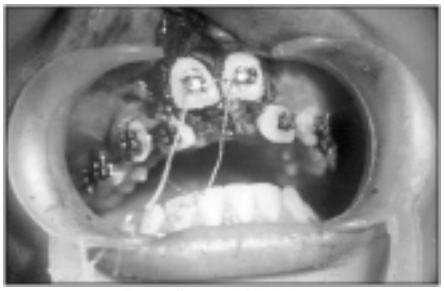

Fig 5. : Extracted Mesiodens

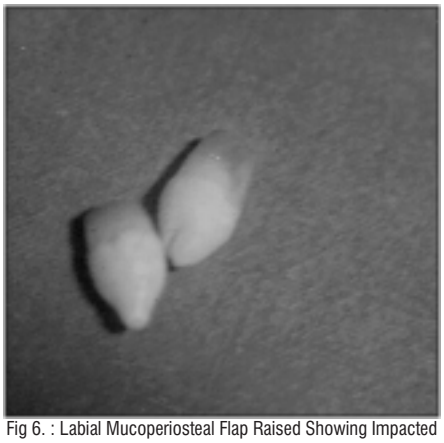

Fig 6. : Labial Mucoperiosteal Flap Raised Showing Impacted Maxillary Central Incisors. Brackets Bonded On Them For Traction To Be Applied

Fig 7. : Flap Sutured And Traction Applied On Both Central Incisors

Fig 8. : After Three Months, Over Riding Of Incisors Seen And Arch Wire Directly Attached To Tooth

Fig 9. : Maxillary Expansion Plate Delivered To Compensate Overlapping Central Incisors

Fig 10. : Desired Result Achieved

The following factors are used to determine whether successful alignment of an impacted tooth can take place: (1) the position and direction of the impacted tooth, (2) the degree of root completion, (3) the degree of dilacerations, and (4) the presence of space for the impacted tooth.[8] Several reports have demonstrated successfully treated impacted maxillary anterior teeth by proper crown exposure surgery and orthodontic traction.[9]

In the present case, the closed eruption surgical technique was used. This technique is more reliable when aesthetic and periodontal health is considered. Vermette M, Kokich V and Kennedy D[10] recommended the usage of the closed eruption technique when the tooth is in the middle of the alveolus or high near the nasal spine. In this case the periodontal status of the exposed incisor after orthodontic treatment revealed an acceptable gingival contour and attached gingiva.

Conclusion And Clinical Significance

Forced eruption of impacted teeth and removal of supernumerary teeth must always be considered in young patients. A unique technique for traction was employed so as to cause minimal injury to the neighboring soft tissue. This may

become the method of choice over extractions or surgical repositioning.

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