

Case Report

Surgical repositioning of an impacted and dilacerated central incisor: A case report

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Abstract

This case report describes the management of an impacted and dilacerated upper permanent incisor in an 11 year old girl who also presented with a congenitally missing lateral incisor in the same quadrant. The two treatment options commonly chosen for the management of an impacted incisor are surgical exposure followed by orthodontic traction and extraction of the tooth itself. This case posed an extra challenge as the adjacent lateral incisor was congenitally missing. Instead of resorting to the use of dentures, an alternative treatment involving the surgical repositioning of the impacted tooth was done. This method not only satisfied the patient's aesthetic requirement but ensured preservation of alveolar bone height and thickness in the upper anterior segment. Surgical repositioning of an impacted and/or dilacerated tooth can be considered as an alternative treatment option when surgical exposure and traction of the tooth is not possible.

Keywords: *surgical repositioning, hypodontia, impacted tooth*

Introduction

Missing anterior teeth is a common problem faced by many young patients and can be caused by either an impaction or hypodontia of that particular tooth. The possible causes for failure of eruption or impaction of a tooth include presence of a supernumerary, dilacerated tooth, tooth malposition, abnormal inclination, retained deciduous tooth, developmental displacements and dense mucoperiosteum¹. Hypodontia is the developmental absence of one or more teeth from the dentition. It is more common in the permanent dentition than the primary and the most common missing tooth varies between different regions and races. In the Malaysian context, the most commonly missing permanent tooth is the maxillary lateral

incisor². This article presents a case of an impacted and dilacerated central incisor and missing lateral incisor in the same quadrant. An alternative treatment of surgical repositioning of the impacted and dilacerated tooth was done in view of the clinical presentation and patient need.

Case Report

A 11 year old Malay girl was referred to the Department Of Children Dentistry, University Malaya with a complaint of missing upper left front teeth. She was very concerned about her appearance as she was often teased in school. The child was medically fit and healthy and had no history of dental trauma.

The patient presented with a Class III incisor relationship on a Class I facial profile³. The overjet was 1mm and the overbite was decreased. The molars were in Class I relationship on both sides. She was in a late mixed

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dentition stage where all her lower permanents had erupted but upper deciduous canines and molars were still present. Clinically, there were 2 missing teeth, the upper left permanent central and lateral incisors (Fig 1). The contralateral permanent incisor had erupted into the arch approximately 4 years prior to this.



Figure 1: Missing upper left permanent incisors. Class III incisor relationship with positive overjet

A dental panoramic tomography [DPT] (Fig 2) and upper anterior occlusal (UAO) radiograph revealed :

- i. A missing upper left permanent lateral incisor
- ii. Severely displaced upper left permanent central incisor

Application of vertical parallax to the DPT and UAO indicated that the crown of the incisor was displaced labially.



Figure 2: Pretreatment panoramic radiograph showing impacted upper left central incisor

A cone beam computer tomography (CBCT) was done to ascertain the exact location and anatomical form of the impacted tooth. The re-

sults showed that the upper left central incisor was displaced superiorly, $>90^\circ$ (Fig 3A) and there was a dilaceration involving the apical third of the root (Fig 3B).

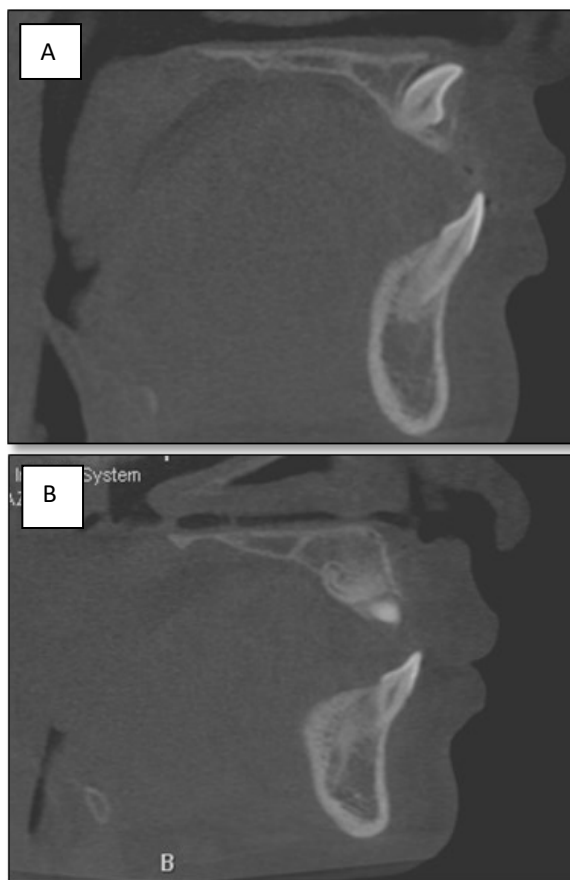


Figure 3: : A , sagittal view showing superior displacement of incisor crown. B, sagittal view showing dilaceration of apical third of root

Treatment Plan and Progress

The following options were considered:

- i. Surgical removal of the impacted central incisor and interim removable prosthesis until growth has ceased and patient ready for restoration with bridge or implant
- ii. Surgical exposure and orthodontic traction of the impacted and dilacerated tooth
- iii. Surgical removal of the impacted tooth followed by auto-transplantation with a lower premolar

As all the lower permanent teeth had all erupted and there was spacing in the arch, removal of a lower premolar for the purpose of auto-transplantation was not suitable. After discussion with the orthodontist, it was decided that the upper left central incisor was not in a favor-

able position for orthodontic traction. This left us with the option of surgical removal of the tooth followed by removable denture as a temporary measure. An alternative treatment plan was offered to the patient whereby the impacted and dilacerated tooth would be surgical repositioned. This technique was based on the auto-transplantation method, but using the dilacerated tooth itself. The patient and her parents were keen on this treatment option as the patient could avoid having to wear a removable prosthesis.

The surgical repositioning of the impacted incisor was done under general anesthesia. A muco-gingival flap was raised and a bulge was palpable at the sulcus region. Thin overlying bone was removed and the crown of the incisor was visible. A stainless steel wire (0.7mm) was secured around the cement-enamel junction (CEJ) of the buried tooth. The removal of the tooth was done with minimal trauma by slowly teasing the tooth out using a straight forceps, while carefully guiding it using the attached wire (Fig 4). The upper left central incisor was placed in a new position using the contra-lateral



Figure 4: Stainless steel wire around the CEJ and straight forceps used to remove impacted tooth

tooth as a guide (Fig 5). A black silk suture was used to close the muco-gingival flap and to ensure a good gingival cuff around the repositioned tooth. A splint was placed across both the central incisors using a stainless steel wire and composite resin.

The patient was reviewed one week later and suture removal was done. The splint was intact and the upper left central incisor had a mobility of grade III (Fig 6).



Figure 5: Placement of the dilacerated tooth in its new position



Figure 6: 1 week post surgery. Splint in place



Figure 7: Root filled upper left central incisor

The splint was removed two weeks later and endodontic therapy was commenced. The patient was reviewed 3 months after the completion of the endodontic treatment (Fig 7). The upper left canine has erupted into the arch, reducing the notable spacing in the upper left anterior segment. The patient is happy with her current aesthetics and is motivated to continue with orthodontic treatment for final alignment (Fig 8).



Figure 8: 6 moths post surgery

Discussion

The choice of treatment of an impacted incisor with root dilacerations would depend on the viability of the tooth and whether the tooth can be successfully brought into a favorable position within the arch. Although many treatment methods have been described in the literature, the most common treatment include surgical exposure and orthodontic traction or extraction of the tooth itself⁴. However, this technique may prove to be difficult in cases where the root of the impacted tooth has fully developed or dilacerated⁵. Moreover, in this case, the tooth is in an unfavorable position with an angulation exceeding 90° from its axis. Extraction of the tooth may be a quick solution but may result in more complications after treatment⁵. Early loss of a maxillary anterior tooth may result in midline shift, the space being occupied by an adjacent tooth and loss of alveolar height in the affected region. The space arising from the missing central incisor can be closed orthodontically if the patient has a crowded dentition or accompanying Class II malocclusion⁶. In this case, the patient presented with a Class III malocclusion a dentition with generalized spacing. The space arising from the unerupted central incisor and congenitally missing lateral incisor was wide and closing the space orthodontically would only worsen the malocclusion and result in poor aesthetics.

In mature patients, various designs of prosthesis can be used to fill the space of the incisors. However, the nature of a growing dentition in young patients makes a permanent prosthesis

or implant unsuitable. A removable interim prosthesis or space maintainer is needed until early adulthood when definitive prosthetic treatment can be done⁵.

Auto-transplantation using premolars is advocated to replace missing anterior teeth in growing patients, an option with advantages over those of implants or fixed prosthesis⁷. However, the availability of the donor tooth is the greatest limitation⁵. This proved to be the problem in this case where there was generalized spacing in both arches. Thus the option of repositioning was chosen. Surgical repositioning of a tooth refers to the procedure where there displaced tooth is surgically accessed and manipulated into its correct position subsequent to the removal of the cause and creation of a new socket in the same alveolar bone⁴. This technique has also been successfully carried out in dilacerated and severely displaced incisors^{1,8,9}. In this case, a lack of bone structure at the site of transplantation resulted in severe mobility during the initial phase of healing. However, radiographic evidence of bone formation around the root was seen on further follow up. No signs of ankylosis or root resorption were seen throughout the first year of review. Splinting is not essential in auto-transplantation but appears to be beneficial in most cases¹⁰. Most authors advise flexible splinting for 7-10 days as this allows for some functional movement of the transplant. It has been suggested that this movement stimulates periodontal ligament cellular activity and bone repair¹¹. The splinting period can be decided according to the reduction of mobility observed during the healing stage after transplantation. It ranges between 2 weeks to 2 months, depending on the cases¹⁰. Pulp tissue in a fully developed transplanted tooth cannot regenerate. If the tooth is accessible, endodontic treatment can be completed prior to the transplant. In the case of impacted teeth, the root canal treatment should be started about two weeks after the transplantation. Endodontic treatment performed too soon after surgery may cause additional periodontal ligament (PDL) damage and if it is delayed, inflammatory resorption may develop due to infection¹². The most significant determinant for the survival of a transplanted tooth is the continued

vitality of the PDL. In cases where the PDL is traumatized during transplantation, external root resorption and ankylosis are often noted¹³. In conclusion, surgical repositioning of an impacted tooth can be considered as an alternative treatment modality in selected cases where traction of the tooth is not feasible.

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