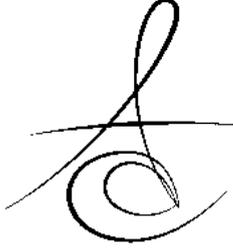


CASE REPORT: SURGICAL REPOSITIONING OF A DILACERATED MAXILLARY CENTRAL INCISOR

VAKA RAPORU: DİLASERE ÜST ÇENE SANTRAL DİŞİN CERRAHİ YENİDEN POZİSYONLANDIRILMASI



Dr. Fidan ALAKUŞ SABUNCUOĞLU* **Dr. Özlem Martı AKGÜN****
Doç.Dr. Metin ŞENÇİMEN***

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ABSTRACT

Dilaceration is a dental deformity characterized by a severe angulation between the crown and root resulting in non-eruption of the tooth. This case report presents the surgical repositioning of a dilacerated maxillary central incisor and followed by spontaneous eruption, root formation without orthodontic traction. This case is unusual because the diagnosis of dilaceration was made at an early age - before either of the permanent upper central incisors had erupted.

Key-Words: Dilacerated teeth, reposition

ÖZET

Dilaserasyon, dişin sürmemesiyle sonuçlanan kuron ile kök arasında ciddi bir açı ile karakterize dental deformitedir. Bu vaka raporunda, ortodontik traksiyon yapılmadan dilasere üst çene santral dişin cerrahi olarak yeniden pozisyonlandırılması ve spontan erüpsiyonu sunulmaktadır. Bu vaka raporu dilaserasyonun erken yaşta tanısının konulması ve kalıcı santral dişin sürmesinden önce olması sebebiyle olagan dışıdır.

Anahtar kelimeler: Dilasere diş, yeniden pozisyonlanma

INTRODUCTION

Unerupted teeth are often encountered in orthodontic practice. The maxillary canine is the most frequently impacted tooth in the anterior region of the mouth; however, an impacted maxillary central incisor poses a problem at an earlier age, since the central incisor usually erupts years before the canine. In addition, an impacted maxillary central incisor is more conspicuous to parents.¹

The most common causes of impaction are localized and include a lack of space for eruption; prolonged retention or early loss of the deciduous tooth; an abnormal positioning of the tooth bud; the presence of an alveolar cleft; ankylosis; a cystic or neoplastic formation; alveolar or dental trauma; and root dilaceration.²

Dilaceration is the result of a developmental anomaly in which an abrupt change in the axial inclination between crown and root can be observed. Although the aetiology of this anomaly is controversial,³⁻⁴ the most probable cause is mechanical trauma to the calcified portion of a developing tooth.⁵⁻⁶ Syndromes and ectopic development of the tooth germ may also result in dilaceration;⁷⁻⁸ however, when a dilacerated tooth is anteriorly located, trauma would seem a more likely factor.⁹

Treatment alternatives include extraction of the impacted tooth, if the dilaceration is very severe, and surgical exposure followed by extrusion or spontaneous eruption, if the dilaceration is less

*Department of Orthodontics Dentistry, Erzurum Maresal Çakmak Military Hospital, Erzurum, Turkey

**Department of Pediatric Center of Dental Sciences, Gulhane Medical Academy, Etlik, Ankara, Turkey Gulhane Medical Academy,

***Oral Surgery Department



severe.¹⁰⁻¹³ Assessing the prognosis of and designing a treatment plan for a dilacerated impacted tooth are often difficult tasks.¹³ The success rate of surgical exposure of an impacted dilacerated tooth depends on degree of dilaceration, root formation stage and tooth position. If the developing maxillary permanent central incisor is in a horizontal position and at the early stage of root formation, surgical repositioning may be followed by spontaneous eruption and root formation. This case study presents the surgical repositioning of a horizontally positioned developing maxillary permanent central incisor, followed by spontaneous eruption and root formation without orthodontic traction.

DIAGNOSIS

A 7-year-old female came to our dental department in the month of January 2008, with the complaint of unesthetic smile caused by the absence of maxillary anterior teeth (Fig.1a,b).

The patient was asymptomatic. On taking the history, it was found that the accident had occurred 1 years previously. After the trauma, the maxillary upper right central deciduous incisor teeth was losted coronal tooth structure (Fig.1a-e). Examination of the oral cavity revealed it was generally healthy with the exception of dental caries. An intraoral examination indicated early mixed dentition and an Angle Class I molar relationship. (Fig.1c-e). A panoramic radiograph revealed the maxillary right central incisor to be positioned horizontally, with the incisal edge of the crown close to the apex of the left central incisor (Fig.1f). A lateral cephalometric radiograph also showed the crown of the maxillary right central incisor to be positioned horizontally, with an angle of approximately 90° between root and crown (Fig.1g). The aetiology of the unerupted central incisor was extrapolated from the patient's history as stemming from a traumatic episode 1 year earlier in which she had horizontally fractured and lost the upper right central deciduous incisor at its initial stage of root formation.

Treatment plan

The treatment plan consisted of surgical repositioning of the permanent maxillary right central incisor from a horizontal to a vertical position, to be followed by spontaneous eruption and root formation without orthodontic traction.



Fig.1. Pre-treatment extraoral - intraoral views and radiographs.

Treatment alternatives

Alternative treatment options included the following:

1. Extraction of the impacted permanent maxillary right central incisor and eventual restoration with a bridge or implant after growth had ceased.
2. Extraction of the impacted central incisor followed by prosthetic restoration to close the space, substituting the lateral incisor for the central incisor.
3. Surgical exposure, orthodontic space opening and traction of the impacted central incisor into the proper position.

Treatment progress

The advantages and disadvantages of the treatment options were explained to the patient's parents, who opted for surgical repositioning of the dilacerated tooth, although fully aware of the uncertain prognosis.

The central incisor was surgically exposed using the closed-eruption technique. After opening a flap, the surrounding bone was carefully removed from the horizontally positioned crown, and the tooth follicle was separated from the socket. After repositioning the incisor in its correct orientation, the flap was returned to its original location (Fig.2a-e).

The patient was recalled for observation at 2-month intervals. Seven months after the surgery, the maxillary central incisor was exposed in the oral cavity and followed by the space closure utilizing simple removable orthodontic appliance (Fig.2f-i). After nearly 11 months, the maxillary central incisor was brought into alignment in the dental arch (Fig.2.j-n).

During two years after treatment, the patient was seen at 4-month intervals to control the vitality of the dilacerated and the stability of the results obtained (Fig. 3).

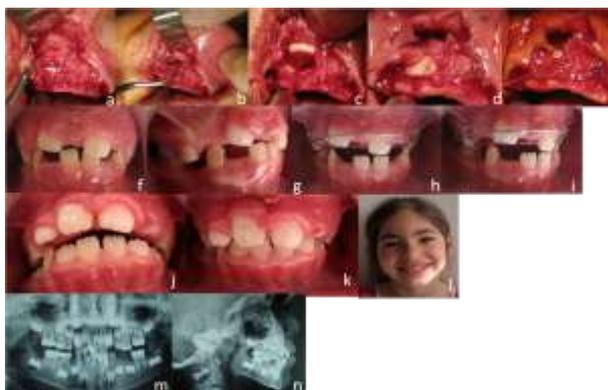


Fig.2. Surgical phase, removable orthodontic treatment phase and extraoral-intraoral photographs-radiographs of patient after treatment



Fig.3. Facial-intraoral photographs, cephalometric-panoramic radiographs two years after treatment.

RESULTS

The result was clinically favorable, with the dilacerated tooth successfully repositioned into proper alignment. A radiograph showed the newly positioned incisor to have an intact straight root with no apparent root resorption and a total root length similar to that of the properly positioned adjacent tooth. The erupted incisor remained vital and responded normally to percussion, mobility and sensitivity testing. No pulp pathology or color change was observed, although slight gingival recession was visible at the labial gingiva. Follow-up radiographs showed continued root development with pulp revascularization and a normal periodontal space and lamina dura. The treatment was

complete after 16 months, with no orthodontic traction required (Fig.2j-n). Follow-up visits were scheduled at 6-month intervals to control for tooth vitality and stability of the results.

DISCUSSION

Dilaceration is a dental deformity characterized by a severe angulation between the crown and root resulting in non-eruption of the tooth. The crown of a dilacerated incisor is usually dilacerated forward, with the palatal surface facing the vestibular site, the incisal edged turned upwards towards the anterior nasal bone and the root remaining in its normal position. Although the exact cause of dilaceration is unknown, it is believed to arise as a result of trauma to a developing tooth that alters the angle between the tooth germ and the portion of the tooth that is already developed.⁵⁻⁶ Smith and Winter¹⁴ attributed dilaceration of a permanent incisor to the traumatic injury of its primary predecessor.

Due to the complexity of surgical/orthodontic procedures, extraction has been the primary treatment choice for an impacted dilacerated tooth; however, many clinicians prefer a combination of surgical and orthodontic therapy or surgical repositioning,¹⁵⁻¹⁷ despite the fact that combined surgical/orthodontic therapy requires a longer treatment period than other treatment options. Ankylosis, pulp necrosis, root resorption and periodontal and aesthetic problems may occur with combined surgical/orthodontic therapy. According to Machtei et al,¹⁸ surgical exposure of a horizontally impacted maxillary central incisor followed by orthodontic traction results in unaesthetic gingival tissue surrounding the exposed incisor that requires periodontal surgery. In the case presented here, no orthodontic traction was necessary, since the position, periodontal attachment, gingival contour and probing depths of the incisor were all normal after surgical repositioning.

In the present case, surgical repositioning took place when the patient was 7 years of age and the maxillary central incisor root was at an early stage of formation. Tsai¹⁹ and Agrait²⁰ et al. both reported cases in which surgical repositioning of the maxillary permanent central incisor was performed at 9 years of age; however, neither report mentions the stage of root development at the time of repositioning. It is likely that in comparison to these previous reports, the

tooth in the case reported here was at an earlier stage of root formation, which would allow for greater mobility of the developing incisor without injury to the developing root.

This case suggests that the success of surgical repositioning of a horizontally developing maxillary permanent central incisor depends on the degree of root formation, with a better prognosis likely for teeth at earlier stages of root formation.

CONCLUSION

The method of surgical repositioning presented here to bring a developing maxillary permanent central incisor in a horizontal position into alignment is a viable alternative to both the traditional approach of extraction and to surgical exposure followed by orthodontic traction.

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Yazışma Adresi

Dr. Fidan ALAKUŞ SABUNCUOĞLU
Department of Orthodontics Dentistry,
Erzurum Maresal Çakmak Military Hospital,
Tel: + 90 442 341 2665,
Fax: + 90 442 304 2660
e-mali: fidansabuncuoglu@yahoo.com.tr

