

Eruption Disturbance of Permanent Incisors Caused by Mesiodentes Associated with Dens Invaginatus: A Case Report

Dens Invaginatus Bulunan Mesiodensler Nedeniyle Daimi Keserlerde Sürme Engellenmesi: Olgu Raporu

*H. Cem GÜNGÖR DDS, PhD, **İlken KOCADERELİ DDS, PhD,
Oğuzcan KASABOĞLU DDS, PhD, *Serdar UYSAL DDS, PhD

* Hacettepe University Faculty of Dentistry, Department of Pediatric Dentistry

** Hacettepe University Faculty of Dentistry, Department of Orthodontics

*** Hacettepe University Faculty of Dentistry, Department of Oral Surgery

**** Hacettepe University Faculty of Dentistry, Department of Oral Diagnosis and Radiology

ABSTRACT

Mesiodentes are unerupted supernumerary teeth in the central region of the premaxilla between the two central incisors. Mesiodentes are the most common supernumerary teeth and usually are responsible for eruption disturbance/delay of maxillary anterior permanent teeth. Dens in dente is an anomaly of the cap stage of tooth development. This case presentation aims to report the eruption disturbance of maxillary permanent central incisors caused by mesiodentes associated with dens invaginatus and management of the condition.

KEYWORDS

Mesiodens, Dens invaginatus, Eruption disturbance

ÖZET

Mesiodens üst çene orta hat bölgesinde görülen normalden fazla sayıdaki dişleri belirtmek amacıyla kullanılan bir terimdir. En sık rastlanan süpernumere diş olmasının yanı sıra mesiodens, üst çene ön bölge dişlerinde sürme gecikmesinin nedenlerinden biridir. Bir diş gelişim anomalisi olan dens in dente süpernumere dişlerle de birlikte görülebilmektedir. Sunulan çalışmada, üst çene ön bölge daimi dişleri sürme gecikmesi gösteren bir olguda uygulanan tedavi yaklaşımı bildirilmiştir.

ANAHTAR KELİMELER

Mesiodens, Dens in dente, Sürme gecikmesi

INTRODUCTION

Supernumerary teeth are defined as any teeth in excess of the normal number. The prevalence of hyperdontia is reportedly between 0.15% and 3.9%¹⁻³. Extra teeth may present in both the permanent and the primary dentitions but are 5 times less frequent in the primary dentition⁴⁻⁶. The literature reports that 80% to 90% of all supernumerary teeth occur in the maxilla^{1, 7, 8}. Half are found in the anterior region^{1, 3}.

The etiology and the genetic considerations of supernumerary teeth remain unclear. Among the several theories proposed for the etiology of hyperdontia, the hyperactivity theory has been more accepted. It states that supernumerary teeth are derived from independent local hyperactivity of the dental lamina. The hypothesis is that the lingual extension of an additional tooth bud leads to a eumorphic mesiodens while the rudimentary form arises from proliferation of epithelial remnants of the dental lamina induced by pressure of dentition^{5, 8}.

The term mesiodens refers to a supernumerary tooth present in the midline of maxilla between the two central incisors. Mesiodens can occur individually or as multiples (mesiodentes), may appear unilaterally or bilaterally, and often do not erupt⁹. Mesiodentes are the most common supernumerary teeth and the literature reports its overall prevalence to be between 0.15% and 1.9%^{1, 3, 4}.

Dens invaginatus, also known as dens in dente, is a developmental anomaly which results from an invagination in the surface of a tooth crown before calcification has occurred^{10, 11}. Affected teeth show a deep enfolding of enamel and dentin starting from foramen cecum or the tip of the cusps which may have extended deep into the root¹². Cases of dental invagination in supernumerary teeth have been presented¹³⁻¹⁶.

The aim of this case presentation is to report the management of a case of eruption disturbance of maxillary permanent incisors caused by mesiodentes associated with dens invaginatus.

CASE REPORT

An eight-year and six-month-old boy was brought to the Pediatric Dentistry clinics by his parents. The parents expressed their concerns about the “eruption failure” of their child’s anterior permanent teeth. The patient’s medical history was unremarkable. Intraoral examination revealed that the patient was in mixed dentition. Mandibular central and lateral incisors have erupted and were well-aligned on the arch. However, maxillary primary incisors were over-retained. Although primary lateral incisors were slightly mobile, central incisors showed no signs of mobility. Panoramic and periapical radiographs taken from the related site led to the diagnosis of mesiodentes causing eruption disturbance of central incisors (Figure 1 and 2).



FIGURE 1

Preoperative panoramic radiograph of the patient



FIGURE 2

Maxillary periapical radiograph showing mesiodentes causing eruption disturbance of the permanent central incisors

The management of the case initiated with extraction of all primary incisors. Surgical removal of mesiodentes was postponed until full eruption of lateral incisors. Two months later, lateral incisors erupted and mesiodentes were extracted under local anesthesia. The extracted mesiodentes had bulbous shapes. After extraction, they were stored in neutral buffered formalin and submitted to histologic evaluation.

The teeth were decalcified for two months. The specimens were washed in several changes of 95% alcohol and dehydrated in absolute alcohol. After the specimens were embedded in paraffin, 5 μ m sections were cut parallel to the long axis of both teeth in a buccolingual direction and stained with hematoxylin-eosin. Histologic evaluation revealed that both mesiodens had dens invaginatus (Figure 3).

The patient was scheduled for follow-up visits at three-month intervals. At the sixth month visit, it was observed that the incisors' eruption was being hindered by the dense nature of the gingiva covering the alveolar bone. It was planned to uncover the labial surfaces of permanent incisors and place orthodontic buttons to stimulate mechanical eruption. Under local anesthesia, window-like excisions were done. Prior to this, the impression of the maxilla was made and a removable appliance comprising two Adams clasps and a labial bow with an occlusal offset

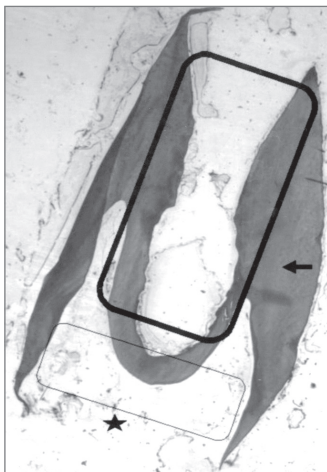


FIGURE 3

*Histologic view at $\times 1$ magnification. *: root, arrow: dentin; thick rectangle: first tooth; thin rectangle: second tooth*

bend loop (confronting central incisors) was fabricated. Following bleeding control, orthodontic buttons were bonded to the middle third of the labial surfaces of crowns. Final adjustments of the appliance were performed in the mouth. After insertion, elastic strings were placed around the orthodontic buttons and tied to the loops of the labial bow (Figure 4). The parents were instructed on the change of elastic strings. The changes were done twice a week and the progress was evaluated by the clinician each month. Approximately 10 mm of extrusion was accomplished in five months. The outcome of the treatment was satisfactory and the treatment was discontinued (Figure 5).

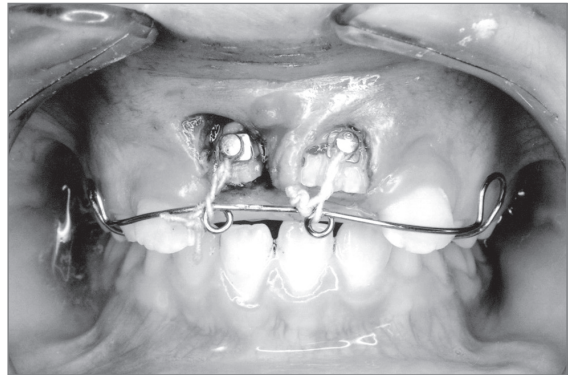


FIGURE 4

The removable appliance used for mechanical eruption of central incisors. Note orthodontic buttons bonded to labial surfaces of teeth and elastic strings tied to them



FIGURE 5

Intraoral view of the patient at the completion of the treatment

DISCUSSION

Mesiodentes are frequently associated with various craniofacial anomalies, including cleft lip and palate, Gardner's Syndrome, Fabry-Anderson's Syndrome and cleidocranial dysostosis⁶. However, the patient had no symptoms suggestive of a syndromic background.

Mesiodentes are best detected through clinical and radiographic examination. While overretained maxillary primary anterior teeth may indicate a suspicious condition, radiographic examination of the related site is mandatory for a definitive diagnosis. Along with the maxillary anterior occlusal views, periapical radiographs can help establish a bucco-palatal location of the mesiodentes. If permanent incisors are retained or their eruption is disturbed or ill-positioned, a radiographic examination must be performed^{17, 18}.

The most common complication associated with mesiodens (or mesiodentes) is the eruption disturbance/delay that may cause in the maxillary anterior region. About 25% of mesiodentes presenting in the maxilla erupt into the oral cavity⁹. The majority of unerupted teeth are observed in the permanent dentition and are relatively common in the early-mixed dentition age¹. Lack of space, malformation from early trauma, mechanical obstruction such as a supernumerary tooth, odontoma or scar tissue due to early loss of primary teeth have been reported for the possible reasons of eruption failure^{1, 2, 19, 20}.

In children and adolescents, extraction of mesiodens have been recommended in order to avoid possible effects on adjacent as well as cyst formation^{18, 21}. In the early mixed dentition stage, extraction of the mesiodens has been suggested to facilitate spontaneous eruption and alignment of incisors, while minimizing intervention, space loss and midline shift²². Should the incisors not erupt spontaneously, further surgical and orthodontic treatment may be required.

During surgical operation, the position of retained incisors was found to be high up which made it complex to place orthodontic buttons to

stimulate their mechanical eruption. Considering the risks involved (damage to the teeth, loss of vitality, tolerance of the patient to the surgery)²³, it was only decided to extract the mesiodentes at that session. This approach allowed for normal and physiologic eruption of central incisors. However, the eruption of central incisors was later hindered by the dense gingiva covering the alveolar bone.

Patient compliance is a critical factor for the expected outcome of orthodontic tooth movement with removable appliances. However, together with the use of elastics, the removable appliance used in this case seemed to increase patient's willingness to wear it as he could see the improvement during treatment period.

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CORRESPONDING ADDRESS

H. Cem GÜNGÖR DDS, PhD

Hacettepe University, Faculty of Dentistry, Department of Pediatric 06100, Ankara/Turkey

Tel: +90 312 3052280 Fax: +90 312 3243190 E-mail: hgungor@hacettepe.edu.tr