

Delayed Surgical Removal of Labio-palatal-placed Impacted Mesiodens in an 11-year-old Boy — A Case Report

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Abstract

The emergence of the supernumerary tooth is a result of problems in dental development. Mesiodens is one supernumerary tooth located in the maxillary central incisor region. The most frequent complications associated with mesiodens are delayed eruption of permanent incisors and midline diastema. The best time for removal is between 8 and 10 years of age. Complex surgical and orthodontic management may be necessary if there is delay of treatment. An 11-year-old child presented with a chief complaint of labial inversion of the right central incisor that gave an unaesthetic appearance. The periapical and occlusal radiograph revealed an impacted mesiodens that was located between the two maxillary central incisors. Surgical removal was indicated. This report indicates that early diagnosis and timely treatment are important for preventing complication and more complex interventions.

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Introduction

Dental development is a continuous growth process that continues until the tooth's final form and structure are achieved.¹ However, problems in the initiation and proliferation of dental development can result in the alteration of a number of teeth.² A supernumerary tooth is an anomaly in a number of teeth that can found anywhere.^{1,3}

Supernumerary teeth have a 98% chance of appearing in the maxilla, and of these, 75% occur within the maxillary midline. Therefore, supernumerary teeth may vary from a simple odontoma, to a conical or tuberculate tooth, and to a supplemental tooth that closely resembles a normal tooth. The etiology of mesiodens remains unclear; although, several theories have been postulated regarding the cause of supernumerary teeth, including atavism, the dichotomy of tooth bud and hyperactivity of dental lamina, and other genetic factors.^{1,3,4}

A supernumerary tooth that is located between two upper central incisors is called a mesiodens. The prevalence varies from 0.15% to 1.9% in the general population. The occurrence of mesiodens is twice as likely to occur in males compared to females.^{4,5,6} The mesiodens may erupt spontaneously or stay unerupted.⁶ Most mesiodens teeth are unerupted, with a reported range around 75%.⁷ The conical is the most common form of mesiodens.⁵ Mesiodens often are related to the delayed eruption and displacement of adjacent teeth. Timely treatment of impacted mesiodens is required to prevent further complications.^{2,4,5} Delayed extraction is recommended around the age of 8–10 years. Further delays may cause problems that require more complex surgical and orthodontic treatment.

In RSKGM FKG UI (Rumah Sakit Khusus Gigi dan Mulut FKG UI), mesiodens usually found in patients in the Department of Pedodontics. Few of them was referred to the Department of Oral Surgery because they need treatment of their impacted mesiodens with surgical approach. It is important to note any treatment options and the stages of surgical removal of impacted mesiodens. This paper describes the surgical management of impacted

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mesiodens in an 11-year-old boy in RSKGM FKG UI.

Literature review

Definition

The maxillary anterior midline is the most common site for a supernumerary tooth, in which case the tooth is known as a mesiodens.^{1,2,4} They make up approximately 80% of all supernumerary teeth. The term mesiodens refers to a supernumerary tooth located between two maxillary central incisors. Mesiodens is usually unerupted and has a conical crown and single root. One-third of all patients with a mesiodens also have other supernumerary teeth.^{4,8}

The clinician can use panoramic, maxillary occlusal or periapical radiographs to make a definitive diagnosis.⁴ Mesiodens can be located either palatally (80%), labially (6%), or between the roots of the maxillary permanent central incisors (14%).⁹

Etiology

What causes mesiodens is still unclear, but a few theories have been postulated to explain this tooth, including atavism, tooth germ dichotomy, hyperactivity of dental lamina, and genetic factors.^{1,10,11}

The atavism theory states that mesiodens teeth represent a phylogenetic relic of extinct ancestors who had three central incisors. The tooth germ dichotomy theory postulates that the dental lamina is split to create two teeth, one of which is the mesiodens. Hyperactivity of the dental lamina is the most widely accepted theory. This theory states that the remnants of the dental lamina develop into an extra tooth bud, which results in the mesiodens.^{10,11}

Genetic factors also might play a key role because mesiodens may occur as part of some syndromes, such as Gardner's syndrome, Marfan syndrome, cleft or lip palate, and cleidocranial dysostosis.^{10,11}

Complications

Mesiodens can cause a few complications, such as delayed eruption, displacement of permanent teeth, crowding, midline diastema, abnormal root development of permanent teeth,

cyst formation, or tooth eruption into the nasal cavity. The tuberculate types of mesiodens often cause delayed eruption, while conical types are more related to the displacement of the adjacent tooth.^{3,5,11}

Considering surgical removal

Early diagnosis and timely surgical intervention can reduce, or even eliminate the need for orthodontic treatment and reduce complications. Surgical management is often necessary because 75% of all mesiodens teeth are unerupted.^{2,12}

The first factor is the age of the child. The behavior in a patient over 6 years of age would be managed easily. The second is the stage of dental development of the adjacent teeth. In cases of immature root development, surgical trauma can interfere in the development of the roots of the permanent central incisors. Finally, the clinician must be aware of any associated complications. A surgical approach is required when orthodontic treatment is also indicated to eliminate the problems.⁹ Generally the timing of mesiodens removal can be divided into early or late extraction. The early treatment of unerupted mesiodens before the mixed-dentition period may significantly eliminate further complications and the need for orthodontic management.^{6,9,13}

Other studies have indicated delayed extraction is required when the apex of the permanent central incisor nearly forms around the patient age of 8–10 years. Further delay may make complex surgical and orthodontic treatment a requirement.^{5,13}

Procedures of surgical removal of mesiodens

Mesiodens can be removed with a surgical approach using local anesthesia. After achieving complete local anesthesia, the mucoperiosteal flap is opened, depending on the location of the impacted mesiodens. The flap is raised by raspatorium, and the underlying bone is removed until the crown of the mesiodens is exposed. The mesiodens is then extracted. The flap is approximated and sutured with a non-resorbable suturing material, which is removed in a follow-up visit.

Case report

Clinical and Radiographic Examination

An 11-year-old male patient reported to the Department of Pedodontics on September 2, 2016 with the chief complains of an abnormal eruption of a tooth in the upper front region. The patient had no complaints of pain and fever. The patient denied a history of drug or food allergies, systemic disease, and hospitalization.

Based on clinical examination, the patient had facial symmetry; the submandibular lymph nodes were not palpable and were painless. The state of the lips, labial mucosa, buccal mucosa, palate, tongue, the floor of the mouth, and tonsil

were normal. There was no redness in the gingiva. The upper labial frenulum, lower labial frenulum, and the lingual frenulum were low. There were no abnormalities with the enamel and dentin structural, size, and color of the teeth. An angle Class I molar relationship was present. The upper anterior region showed a malposition tooth. Poor oral hygiene with a plaque index 1.6 was found. The state of the teeth was as follows; a labially and partial eruption of 11, the persistence of 74, dental caries in 75 and 85, and class I, type 1 malocclusion.



Figure 1. Intraoral examination

The periapical dental radiograph showed a supernumerary tooth that was impacted at the midline of the maxilla. After being confirmed by occlusal radiograph, the mesiodens was noted as

being labio-palatally placed between the roots of both central incisors, and it did not penetrate the bone and gingival.

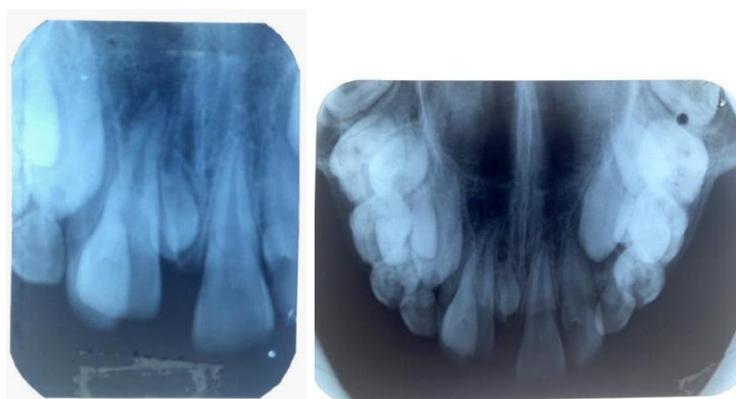


Figure 2. Radiographic examination (a)periapical view (b) occlusal view

The child was referred to the department of oral surgery to carry out the surgical removal of the impacted mesiodens.

Procedures

On September 14, 2016, the patient

had his surgical procedure performed in the Department of Oral Surgery in RSKGM FKG UI. The patient was prepared in a sitting position on the dental unit and then was given local anesthesia with infiltration techniques at the mucobuccal fold and palatal mucosa.

After anesthesia was complete, a circular incision was made from the mesial aspect of the maxillary right central incisor to the mesial aspect of the maxillary left central incisor.

A full thickness labial flap was raised with a periosteal elevator. The impacted mesiodens was luxated out of its socket and removed. The flap was replaced back and sutured with non-resorbable black silk suture.



Figure 3. The impacted tooth was luxated out of its socket and removed

At the one-week post-op, the patient came back to the department of oral surgery in RSKGM FKG UI. The patient did not note any subjective complaints. Based on clinical examination, the

suturing material was intact, and there were no signs of swelling or redness of the gingiva. The suturing material was removed with the aid of tweezers and scissors.



Figure 4. Post-operative healing

Discussion

Mesiodens is the most frequent type of supernumerary tooth. It can spontaneously erupt or unerupted. Delayed eruption and the displacement of the permanent maxillary incisors are more common complications.⁵ The most commonly reported complications are associated with mesiodens are: delayed eruption (34.28%), central diastema (28.57%), and malposition of the permanent incisors (17.14%).¹⁴

The prevalence of mesiodens is higher in boys than in girls.¹⁵ In the current case, mesiodens occurred in an 11-year-old male.

Panoramic, occlusal, and periapical radiographs were used to assist in the diagnosis of the mesiodens.⁶ In this patient, radiographic examination with the periapical and occlusal view was needed to determine the exact position of the impacted mesiodens. Mesiodens can be found either inverted (40%), vertically impacted (20%), vertically erupted (20%), angulated erupted (16%), or labio-palatally impacted (4%). Mesiodens can be one or multiple teeth. Mesiodens with a conical crown is often identified.^{16,17} The current case shows mesiodens that was labio-palatally placed, single, and with a conical type.

The treatment options for managing mesiodens depend on the patient's age, the stage of tooth development, and any related complications.¹⁸ The timing of intervention can be early or late extraction. Some literature recommended delayed extraction around 8–10 years old, after the root formation of the permanent incisors. Further delay may require complex surgical and orthodontic management.^{4,5,19} In this case, the impacted mesiodens showed delayed eruption and displacement of the right central incisors. It was diagnosed after the age of 10, so it was indicated for surgical removal; orthodontic treatment may be necessary.

Surgical removal of a mesiodens can be done under either local anesthesia or general anesthesia. The procedure of surgical removal of an impacted mesiodens includes administering the anesthesia agent, performing a mucoperiosteal flap, reducing the bone around impacted mesiodens, and then removing the mesiodens. In the current case, the flap was replaced and sutured with a black silk suture, and post-operative instructions were given to the patient.^{20,21} After achieving complete anesthesia, flap incision was performed in the labial aspect from the mesial of right central incisors to the mesial of left central incisors. A full thickness flap was raised using a mucoperiosteal elevator. The bone overlying the crown of the tooth was removed using a carbide bur and saline spray. The impacted tooth was exposed, luxated out of its socket, and removed. The flap was replaced back and sutured with a non-resorbable black silk suture. Post-surgical instructions were explained to the patient, and he was kept on analgesic and antibiotic coverage. The recall visit was scheduled for a week later so that suturing material could be removed.

Conclusion

Mesiodens is a supernumerary tooth that presents in the midline of the maxilla. A labio-palatal-placed impacted mesiodens is rare. It results in the delayed eruption and displacement of the adjacent permanent tooth. Late diagnosis in patients after the age of 10 can cause more complex treatment.

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