

Multidisciplinary Management and Long-Term Follow-up of Mesiodens: A Case Report

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Supernumerary teeth are relatively common in the oral cavity and are characterized by an excessive number of teeth. The term “mesiodens” refers to a supernumerary tooth located in the midline of the maxilla between the central incisors. Mesiodens may cause a variety of pathological complications such as impaction of the maxillary central incisors, tooth retention or delayed eruption of the permanent incisors, crowding, eruption within the nasal cavity, formation of diastema, intraoral infection, root anomaly, root resorption of adjacent teeth and cyst formation accompanied by bone destruction. Therefore it is recommended to follow-up with regular radiographic examination. Early diagnosis minimizes treatment needs and prevents associated complications. The present case, followed for 7 years, presented bilateral mesiodens resulting in delayed eruption of the permanent incisors and emphasizes the importance of multidisciplinary management and long-term follow-up.

Keywords: Mesiodens, supernumerary tooth, management

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INTRODUCTION

Supernumerary teeth or hyperdontia is defined as an excess in number of teeth compared to the normal dental complement.¹ Extra teeth may be present in both the permanent and primary dentitions, however they are 5 times less frequent in the primary dentition.² They may occur alone or as multiples, unilateral or bilateral, in the maxilla or the mandible, or both.³ The Caucasian population prevalence ranges from 2 to 2.65%.⁴

The etiology of supernumerary teeth is not completely understood. Over the years, suggestions or theories have been put forward to explain this anomaly. The first theory is the atavistic theory that can be explained as phylogenetic

reversion. The second, or dichotomy theory, states that the supernumerary tooth is formed as a result of a dichotomy of the tooth bud. The third, or dental lamina theory, indicates that supernumeraries are derived from local, independent hyperactivity of the dental lamina. A combination of genetic and environmental factors may also play a role in the occurrence of this anomaly, as supernumeraries are more common in the relatives of affected children than in the general population.⁵⁻⁷

Classification is based on the time of appearance (preprimary, similar to permanent, postpermanent or complementary), position in the dental arch (mesiodens, paramolar, postmolar or impacted) or shape (supplemental or rudimentary). Supernumerary teeth may, therefore, vary from a simple odontome, a conical or tuberculate tooth, to a supplemental tooth resembling a normal tooth.⁸

The term “mesiodens” refers to a supernumerary tooth present in the midline of the maxilla between the central incisors.^{9,10} It is the most frequent supernumerary tooth with an overall prevalence of 0.15% to 1.9%. It may occur individually or as multiples (mesiodens), may appear unilaterally or bilaterally, and rarely erupting.^{2,11}

Mesiodens can be detected through clinical and radiographic examinations by using panoramic, occlusal or periapical radiographs.^{2,10} The clinical complications of mesiodens include impaction of the maxillary central incisor, tooth retention or delayed eruption of permanent incisors, crowding, eruption within the nasal cavity, formation of diastema, intraoral infection, root anomaly, root resorption of adjacent teeth and cyst formation accompanied by bone destruction.^{6,10,12}

The present case, followed for 7 years, presents bilateral

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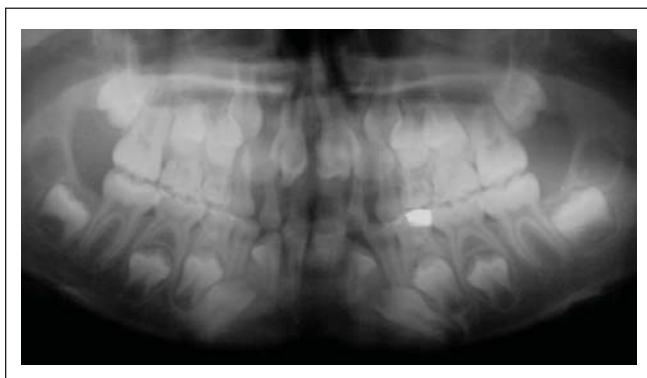


Figure 1. Panoramic radiograph of the patient revealed the two impacted conical mesiodens (at age 8)



Figure 2. Periapical radiograph of the patient

mesiodens delaying the eruption of the permanent incisors and emphasizes the importance of multidisciplinary management and long-term follow-up.

CASE DESCRIPTION

An 8-year-old female patient and her parents visited the Pediatric Dental Clinic with the complaint of retention of the maxillary primary incisors. No significant abnormalities were noted during the extra-oral examination.

The intra-oral examination revealed retention of the maxillary primary incisors and a well-maintained oral health. The panoramic and periapical radiographs showed two completely formed mesiodens (Figures 1 and 2). The patient's medical history was unremarkable and there was no family history of supernumerary or congenitally missing teeth.

The maxillary primary central incisors were extracted under local anesthesia (Figure 3). The surgical extraction of the supernumerary teeth and the exposure of the impacted permanent maxillary incisors were performed 12 months



Figure 3. The intraoral appearance of the patient 12 months after the extraction of maxillary primary central incisors (at age 9)



Figure 4. The intraoral appearance of the patient 12 months after the surgical extraction of impacted supernumerary teeth (at age 10)



Figure 5. The intraoral appearance of the patient with Hawley appliance after fixed orthodontic therapy (at age 15)

later. The patient was closely monitored during this period. (Figure 4). Following the exposure of the impacted maxillary incisors, removable appliances were used for 18 months. Due to the insufficient intercanine width, expansion for the exposed impacted maxillary incisors was required. Therefore, a removable appliance with a midline transversal expansion screw was selected to create the needed transversal space. In order to compensate for the upper expansion

and to create space for the mandibular teeth, a similar appliance with an expansion screw positioned lingually to the incisors was placed in the mandible. Upon completion of the permanent dentition, fixed appliances were placed following four premolar extractions. Roth prescription 0.018 x 0.025 brackets were used to close the extraction spaces following maximum anchorage principles. Hawley removable appliances were used for retention. Esthetics and function were established (Figure 5).

DISCUSSION

It has been reported that the most common cause of impaction of upper central incisors are odontoma-like supernumerary teeth.¹ Supernumerary teeth are classified according to shape, size and location.⁸ The present case reports two conical mesiodens. The following are characteristics of conical mesiodens:

- Usually located between the permanent maxillary central incisors rarely erupting labially.
- Erupt during childhood.
- Usually ahead than adjacent teeth in completing root formation.
- Rarely cause delayed eruption of the central incisors, however they may cause alteration of the eruption path.⁶

Early diagnosis is based on a thorough intraoral examination followed by radiographic analysis.¹ In the present case, the patient visited the dental clinic because of the retention of the maxillary primary incisors. Regular radiographic examination is recommended if the contralateral incisors erupt more than 6 months previously.¹³

Early clinical diagnosis and management of this condition is important in order to minimize esthetic and occlusal problems.¹¹ Treatment depends on the type and position of the supernumerary tooth, its effect or potential effect on adjacent teeth.⁵

Appropriate timing of surgical removal of supernumerary teeth has also been contentious. Two alternatives have been suggested by Hogstrum and Andersson.¹⁴ The first option involves removal of the supernumerary tooth as soon as diagnosed. This could create dental phobia problems for young children and cause devitalization or deformation of adjacent teeth.⁸ According to the second option, the supernumerary tooth could be left untreated until root development of the adjacent teeth is complete.¹⁴ The potential disadvantages associated with this surgical protocol include the loss of eruptive force of adjacent teeth, loss of space and crowding of the affected arch and possible midline shifts.⁸ Extraction of a supplementary mesiodens in the primary dentition is not usually recommended.¹⁵ However, extraction during the early mixed dentition stage allows normal eruptive forces to promote spontaneous eruption of the permanent central incisors following extraction.⁴ Extraction of a mesiodens at a time appropriate for promoting self-eruption in the early mixed dentition may result in better alignment

of the teeth and may minimize the need for orthodontic treatment.¹⁶

Delay in treatment can create the need for a more complex surgical and orthodontic management.² Thus, the supernumerary teeth in the present case were surgically extracted 12 months after diagnosis. Close monitoring of the dentition is required after the extraction of a mesiodens. Approximately 6 months after the extraction, clinical and radiographic reassessment is recommended to determine if the tooth has erupted.² In the present case, the permanent central incisors erupted 8 months after the surgical extraction of the mesiodens. After the eruption of the maxillary permanent central incisors, a removable orthodontic appliance was used. At the age of 12, fixed orthodontic therapy with extractions of four premolars was performed. Straight wire appliances were used and active treatment lasted for twenty-six months. Hawley appliances were used for retention.

This report attempts to: 1) contribute to the existing knowledge on the treatment of mesiodens, 2) emphasize the need of individualizing the treatment plan, and 3) demonstrate the importance of a collaborative effort among the pediatric dentist, the orthodontist and the oral surgeon to improve comprehensive patient care.

CONCLUSIONS

Since mesiodens may cause pathological complications, regular radiographic examinations at follow-up visits are recommended. Early diagnosis of a mesiodens minimizes treatment needs and prevents the development of associated complications.

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