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Diagnostic and Management of Mesiodens: Two Case Reports

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Abstract

Mesiodens, a common dental anomaly, is characterized by the presence of supernumerary teeth located in the maxillary midline. While often asymptomatic, mesiodens can cause various complications, including delayed eruption, misalignment, or resorption of adjacent teeth, necessitating timely intervention. This article presents two clinical cases: the first involves a single mesiodens, while the second features two mesiodens. These cases highlight the presentation, diagnostic approach, and surgical management of mesiodens. Early diagnosis and intervention are crucial to avoid complications.

Introduction

Supernumerary teeth are additional teeth or odontogenic structures that develop from a tooth germ beyond the normal number expected in each region of the dental arch. These extra teeth can appear in various forms, on one or both sides of the alveolar arches and are more commonly found in the premaxillary region [1,2].

Mesiodens, the most common type of supernumerary teeth, typically appear in the premaxilla of the maxillary incisal region. While mesiodens rarely cause subjective symptoms, they can lead to tooth crowding, diastema, rotation, displacement of adjacent teeth, malocclusion, delayed eruption, prolonged retention of deciduous teeth, or dentigerous cyst formation if not removed [3,4].

They are classified based on their dentition as rudimentary in permanent teeth or supplementary in primary teeth. Additionally, they vary in morphology, appearing as conical, tuberculate, or molariform [5].

The prevalence of mesiodens varies across racial groups and populations. It ranges from 0.3% to 0.8% in primary dentition and from 0.1% to 3.8% in permanent dentition. Mesiodens are twice as common in males as in females. These variations may be due to differences in identification methods and the populations studied [4,6,7].

Only about 25% of mesiodens erupt into the oral cavity, while the rest remain asymptomatic and are often discovered during routine radiographic exams. The most common complications include delayed eruption and displacement of permanent maxillary incisors. Mesiodens usually appear as a single tooth, with

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single cases occurring in 76–86% of instances, double cases in 12–23%, and multiple cases in less than 1% [5,8].

The following reports highlight differences in the diagnosis of mesiodens based on the timing of dental consultation and provide insights into their surgical management. The first case discusses guiding an impacted permanent maxillary central incisor into occlusion, while the second focuses on two mesiodens that led to significant tooth crowding, displacement of adjacent teeth, and the formation of diastema after treatment.

Case Reports

Case 1

A 6-year-old male patient presented to the Department of Pediatric Dentistry at the University of Monastir Dental Clinic with the chief complaint of an extra tooth erupting between the maxillary primary central incisors. The patient had no significant medical conditions or history of facial injury.

Intraoral examination revealed a conical mesiodens erupted palatally between teeth 51 and 61, with a slight mesial inclination toward tooth 51, resulting in buccal displacement of the primary right maxillary central incisor. (Figure 1).

An occlusal X-ray revealed the supernumerary tooth and its impact on the developing permanent central incisor germ (Figure 2). Panoramic radiography confirmed the diagnosis of an isolated mesiodens, with no evidence of additional supernumerary teeth or dental agenesis elsewhere in the dentition (Figure 3).

The treatment protocol involved sequential extraction of the primary maxillary right central incisor (51) followed by surgical removal of the mesiodens, necessitated by the patient's non-cooperation, heightened anxiety, young age, and it being their first dental visit (Figure 4).

Follow-up examination at 15 months post-intervention revealed successful eruption of the permanent central incisor with axial rotation. The treatment plan was modified to include orthodontic therapy to correct the rotational malposition of the erupted permanent incisor (Figure 5).

Figure 1: Intraoral photographs showing the supernumerary tooth (mesiodens) **(A)** Frontal view **(B)** Occlusal view.

Figure 2: Occlusal radiograph showing the mesiodens.

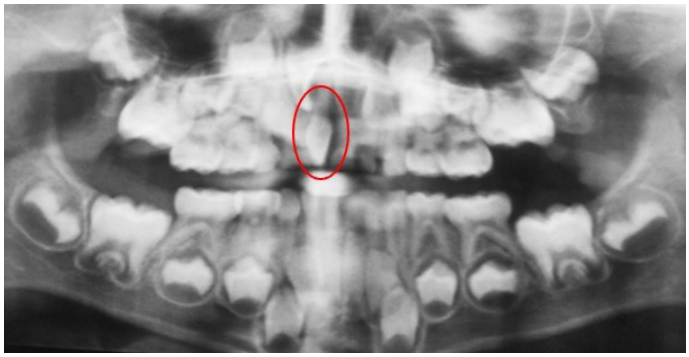

Figure 3: Panoramic radiograph confirmed isolated mesiodens without other anomalies.

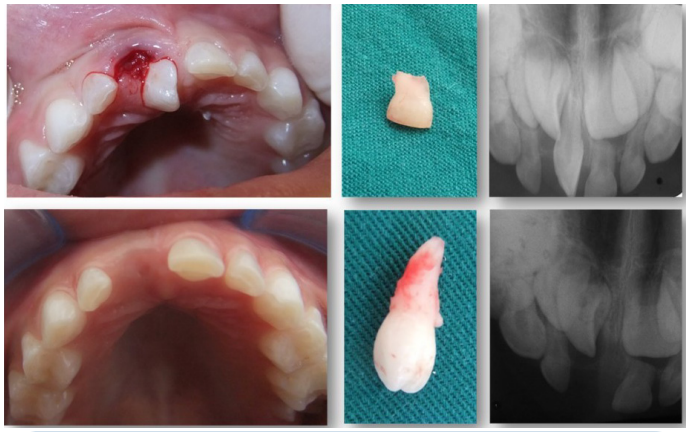

Figure 4: Sequential extraction of tooth 51 followed by conical shape mesiodens removal with radiographic documentation.

Figure 5: Intraoral photograph showing eruption of permanent right central incisor (11) at 15-month follow-up. **(A)** Frontal view **(B)** occlusal view.

Case 2

A 14-year-old female patient presented to the Department of Pediatric Dentistry at the University of Monastir Dental Clinic with an esthetic concern due to malposition of the maxillary canines. The patient was in good general health and had no significant medical history. Clinical examination revealed a supernumerary tooth resembling a lateral incisor located between the two permanent maxillary central incisors, identified as mesiodens (Figure 6).

A panoramic radiograph and a lateral teleradiograph, brought by the patient on the day of her consultation, were obtained for evaluation, enabling the identification of two supernumerary teeth between the central incisors. The panoramic radiograph confirmed the presence of two mesiodens in the maxillary anterior region (Figure 7), while the lateral radiograph provided precise localization and assessment of their relationship with adjacent structures and showed the included mesiodens in rotation and its root is buccally and outside the alveolar bone (Figure 8). The impact of these supernumerary teeth contributed to the existing dental misalignment, emphasizing their role in the

disruption of normal occlusal and eruptive patterns.

The treatment plan involved the surgical extraction of both mesiodens to eliminate the interference they caused in the normal dental arch. The extractions were carried out under local anesthesia without complications (Figure 9). Postoperative care included monitoring for proper healing and ensuring no adverse effects on the adjacent permanent teeth. The two extracted mesiodens have an incisfomal shape, with the included one having a small cusp (Figure 10).

One month after the surgical intervention, clinical examination showed good healing of the extraction sites (Figure 11). The patient was subsequently referred to the Orthodontics Department for comprehensive management. Orthodontic treatment was planned to correct the malposition of the canines and close the remaining diastema.

Figure 6: Intraoral photographs showing the supernumerary tooth (mesiodens).

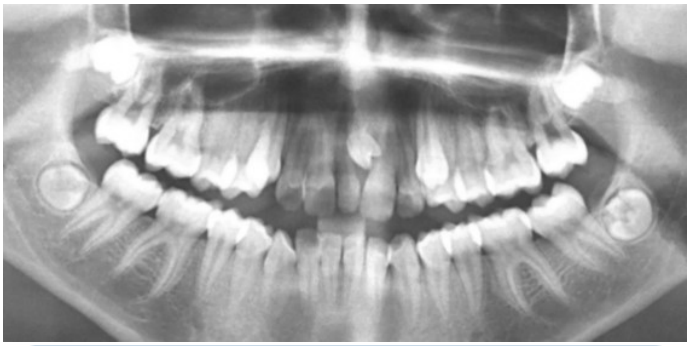

Figure 7: Panoramic radiograph confirmed the presence of two mesiodens.

Figure 8: Lateral radiograph shows the included mesiodens in rotation and its root is buccally and outside the alveolar bone.

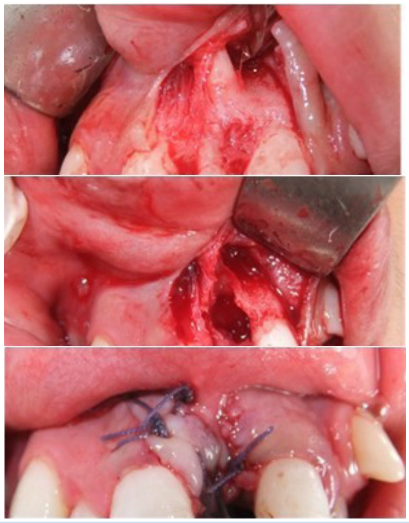

Figure 9: The photographs show the extraction of the two mesiosdens, followed by suturing.

Figure 10: A photo showing the shape of the mesiodens; one has an incisiform shape, the other is tuberculated with a small cupid.

Figure 11: A photo showing a good healing of the extraction sites, with the presence of a large diastema that will be corrected by orthodontics.

Discussion

According to published studies, Mesiodens are the most common supernumerary teeth, located in the maxillary midline between the central incisors, with a reported prevalence of 0.13–2.58%. Studies also indicate that males are affected more frequently than females with male-to-female ratios ranging from 2:1 to 4:1 [1,3,6,9,10].

Mesiodens are classified by shape into conical, which is the most common, supplemental which resembles natural teeth and tuberculate [5,11,12]. In the first case with primary denti-

tion, the mesiodens has a conical shape, while the second case presents double mesiodens, one with a supplemental form and the other tuberculate. This demonstrates all three possible shapes of mesiodens.

The study of Yusa [3] showed that approximately 80% of patients have one mesiodens, 19% have two, and only 1% of cases are with three. Other studies have reported the same percentage [4,13]. Liu et al. [10] reported that only 0.6% of patients had multiple mesiodens, with three or more present. It is normal that in our cases, one patient presented with a single mesiodens, while the other had two.

Double mesiodens, though rare, can cause complications affecting oral health, occlusion, and aesthetics. Treatment typically involves observation or extraction, with timing depending on factors such as the patient's age, case specifics, and adjacent teeth's root development [12,14]. In our cases, the esthetic issue caused by the malposition of maxillary incisors prompted our patients to seek medical advice. In the two cases mentioned above, the mesiodens became progressively esthetically intrusive for the patients, leading to consultation and immediate extraction. Early intervention is not always possible, given the patient's age and lack of cooperation, as in the first case.

Mesiodens can lead to several complications, significantly affecting dental alignment and eruption patterns. The most common issue is midline diastema, where a gap forms between the maxillary central incisors, often necessitating orthodontic intervention [15]. Additionally, delayed eruption of permanent incisors is frequently observed, which may interfere with normal dental development [16]. In a study of kim [17], mesiodens were associated with eruption-related complications in 33.7% of patients, with a higher risk observed in cases involving delayed development of central incisors. These insights can assist clinicians in devising timely and effective treatment plans, prioritizing the reduction of patient discomfort. In rare instances, mesiodens can be associated with dentigerous cyst formation, documented in Lee study [18], which may require surgical removal to prevent further complications. In our clinical observations, one case involved a mesiodens in the temporary dentition that obstructed the eruption of a central incisor, while the other case featured mesiodens and central incisors fully erupted in the permanent dentition, with the parents reporting issues only upon noticing significant esthetic changes. If left untreated, mesiodens have been associated with delayed emergence of permanent teeth and prolonged retention of deciduous teeth. In the second case, extracting the mesiodens was crucial to enable orthodontic treatment for correcting the existing malocclusion. Consequently, in both instances, extraction was promptly performed following the diagnosis.

Panoramic, maxillary occlusal, and periapical radiographs are essential for diagnosing mesiodens. Panoramic radiographs offering global insights into associated, missing, or supernumerary teeth. However, since they provide only two-dimensional information, Cone-Beam Computed Tomography (CBCT) is a valuable complementary tool for accurately determining the location and shape of mesiodens without overlapping structures [5].

The literature suggests that early diagnosis and removal of mesiodens significantly improve the prognosis, helping to prevent potential complications and ensuring better treatment outcomes. There is no consensus on the optimal age for mesiodens removal. Early extraction, before the age of 6, can help minimize complications such as impaired eruption of central incisors, loss of arch space, or midline shift while reducing the need for extensive orthodontic treatment. Performing the procedure under general anesthesia with CT imaging ensures better child cooperation and lowers the risk of damage to adjacent permanent teeth. However, late extraction, between ages 8 and 10, after the adjacent tooth roots have developed, can reduce the risks of injury, root malformation, or devitalization. Psychological factors, including the child's ability to handle surgery, must also be taken into account when determining the best timing for intervention [3,4,7,17].

Studies have shown variations in the timing of unerupted mesiodens removal; however, early extraction during the mixed dentition stage is recommended to encourage proper eruption and alignment of adjacent teeth, minimizing the need for extensive orthodontic treatment [19].

Conclusion

Mesiodens, as relatively common supernumerary teeth, exhibit notable variations in prevalence and characteristics across populations. Early diagnosis and intervention are crucial to avoid complications. Regular dental check-ups, coupled with advanced imaging techniques, are integral to effective management. Pediatric dentists play a role in addressing oral health issues in children and adolescents, particularly as malocclusion and aesthetic concerns become increasingly prominent. This clinical observation underscores the importance of understanding rare conditions like mesiodens and emphasizes the need for evidence-based therapeutic approaches to enhance knowledge and improve patient outcomes.

Author declarations

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity.

Conflicts of interest

There are no conflicts of interest.

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