



(CASE REPORT)



Management of Supernumerary Tooth during the Mixed Dentition Phase: Report of Two Cases and Literature Review

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Abstract

Among the most significant dental abnormalities affecting the primary and early mixed dentition are supernumerary teeth, which can lead to poor dental and facial aesthetics as well as a number of pathological problems with the permanent dentition as it develops. Supernumerary teeth that occur in between the central incisors, specifically in the palatal region are termed as 'mesiodens'. It has a prevalence rate between 0.3% and 3.8% among individuals. Normal tooth growth and development can be disrupted by mesiodens, which can result in infectious pulpitis, root resorption, rotation or displacement of neighbouring teeth, and delayed eruption of permanent teeth. Therefore to avoid the harmful effects of mesiodens on dentoalveolar structures, early diagnosis and treatment is essential. In this paper we discuss the management of two cases of palatally erupted mesiodens and review of literature.

Keywords: Supernumerary teeth; Mesiodens; Extraction; Palatally erupted

1. Introduction

A developmental anomaly where there are more teeth than the typical number is called *hyperdontia* or *supernumerary teeth*¹. They can be unilateral, bilateral, isolated or can be linked to certain developmental syndromes, such as Down syndrome, cleft lip and palate, cleidocranial dysplasia, chorhinophalangeal syndrome, Gardner's syndrome, etc². Depending on the location there are various types of supernumerary teeth that include mesiodens (between the central incisor), paramolar (in molar region) and distomolar (distal to the third molar)³.

About 80% of all supernumerary teeth are "mesiodens" which can occur individually or as multiples called as "mesiodentes"^{1,4}. Depending on their morphology they may be tuberculate, conical, odontome, or closely resemble the normal tooth². With a male to female prevalence ratio of 2:1, mesiodens occurrence rates range from 0.15 to 3.8% for permanent teeth and from 0.9% to 1.9% for deciduous teeth⁵.

The palatal region is typically home to conical mesiodens, which are frequently peg-shaped and have the potential to displace the erupting permanent central incisors and cause diastema⁶. Timely extraction of mesiodens leads to a normal eruption of the central incisors owing to the eruption path of lateral incisors and canine⁷.

This report describes the diagnosis and management of a fully erupted mesiodens in two pediatric dental patient.

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2. Case 1

An 8½ year-old boy reported to the Department of Pediatric and Preventive Dentistry of our institute with a chief complaint of an extra tooth in upper front teeth region which interfered with the speech and mastication. Patient also complained of proclined upper right front tooth and had esthetic concern about the same. On asking there was no past medical, dental and family history. There were no signs of any syndrome associated with the condition.

Intra-oral examination revealed presence of completely erupted conical mesiodens on the palatal aspect of 11 (*Fig.1*). Patient was in mixed dentition phase. There were grossly decayed 52, 54 and 55. Radiographic examination showed well defined conical radio opaque mesiodens superimposing on 11 (*Fig. 2*).



Figure 1 Intra-oral preoperative photograph (frontal and occlusal view)



Figure 2 IOPAR of mesiodens superimposing on 11 (*yellow arrow*)

Extraction of mesiodens was planned. As 52 was grossly decayed and 12 was seen erupting; therefore extraction of 52 was also planned.

Under local anesthesia, extraction of mesiodens and 52 were done. Hemostasis was achieved and pressure pack was given. *Fig. 3* shows immediate extraction socket and extracted mesiodens and primary right lateral incisor (#52).



Figure 3 Extraction socket and extracted mesiodens and #52

There were no post-operative complications reported by the patient at the follow-up visit.

3. Case 2

An 11 year-old male patient reported to our department with a chief complaint of an extra tooth in the upper front teeth region which was causing irritation to the patient. There was no past medical, dental or family history and no syndrome was associated.

On intra-oral and radiographic examination it was observed that a mesiodens was present palatally behind 21 (*Fig.4*). Mesiodens was extracted (*Fig. 5*) under local anesthesia. The wound was healed and there was no post-operative complication reported.



Figure 4 Intra-oral preoperative photograph (occlusal view) and IOPAR of mesiodens superimposing on 21 (*yellow arrow*)



Figure 5 Extraction socket and extracted mesiodens

4. Discussion and literature review

Mesiodens is commonly diagnosed in the mixed dentition phase. We presented these cases to show the incidence and management of mesiodens in young children.

4.1. Classification of MESIODENS⁸ (*Fig. 6*)

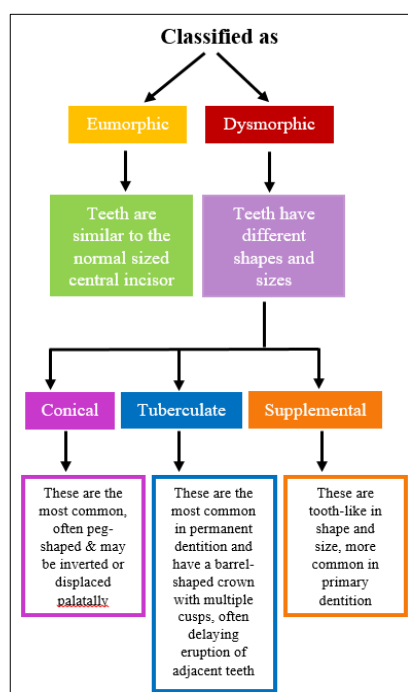


Figure 6 Mesiodens classification

Various theories were given to describe the cause of supernumerary teeth. The "*hyperactivity of dental lamina theory*" is the most widely accepted theory which states that the development of an extra tooth bud from remnants of the dental lamina or palatal offshoots of active dental lamina produces a supernumerary tooth. The "*phylogenetic theory*" asserts that the resurgence of characteristics from extinct ancestors is the cause of the emergence of extra teeth. According to the "*tooth germ dichotomy theory*", a supernumerary tooth is created when the dental lamina divides into different sections⁹. Three cases of mesiodens were documented by *Alarcon et al.*, suggesting that heredity plays a role in the genesis of extra teeth¹⁰.

A wide range of complications can result from mesiodens, including ectopic eruption of adjacent teeth, delayed eruption, midline diastema, impaction, incisor malalignment, displacement and axial rotation of adjacent teeth, radicular resorption of adjacent teeth, crowding, dilatation, migration into the nasal cavity or maxillary sinus, and fistula between the oral and nasal cavity series¹¹. Delay in the eruption of permanent teeth and displacements of permanent maxillary incisors are more common complications. According to *Seddon et al.*, the presence of extra teeth may result in rotation or displacement of neighbouring teeth in 28% to 63% of cases and delayed eruption in 26–52% of cases¹². *Scheiner and Sampson's* reviewed that conical mesiodens frequently result in the displacement of the neighbouring tooth, while tuberculate mesiodens are more likely to produce delayed eruption¹³.

Occasionally there can be cyst formation in respect to the mesiodens; as reported by *Asaumi et al* in an 11-year retrospective study that cyst formation due to supernumerary teeth was observed in 11% of the cases¹⁴. In the present cases, the mesiodens was not associated with any symptoms nor were any other pathologies present elsewhere.

A single conical or peg-shaped mesiodens in the mixed dentition phase was noted in the above mentioned cases which supported a research of *Shih et al.* showing that roughly 90% of mesiodens have a peg-like or conical shape. He also analyzed 105 cases of mesiodens and found that only one case had mesiodens in the permanent dentition while the majority of the cases were diagnosed within or before the early mixed dentition period (95.2%)⁷.

A case of twin mesiodens, one labial and one palatal, giving the appearance of florets and causing the permanent central incisors to procline and rotate, was reported by *Gowri Sankar Singaraju*¹⁵. *AD Dinkar* described a case of impacted mesiodens that caused pain and swelling in the maxillary anterior region due to a dentigerous cyst¹⁶.

Management of supernumerary teeth depends on the type and position of the tooth. The following circumstances typically call for the immediate extraction of the mesiodens: spontaneous eruption of the supernumerary tooth, interference with orthodontic appliances, displacement of the adjacent tooth, inhibition or delay of eruption, or the presence of a pathologic condition. *Munns* stated that – earlier the mesiodens is removed, the better the prognosis¹⁷.

In the early stages of mixed dentition, mesiodens extraction is advised to encourage eruption and proper alignment of neighbouring teeth, potentially reducing the need for orthodontic treatment. According to *Henry and Post*, the mesiodens should be extracted later, around age 10, when the central incisor's apex is almost formed¹⁸.

When making a final decision, a clinician should take the patient's condition into account; however, a recent study by *Yagüe-García et al.* stressed that the best course of treatment is to remove the extra teeth as soon as possible to avoid complications¹⁹.

5. Conclusion

Mesiodens, a common developmental dental anomaly, often poses diagnostic and therapeutic challenges due to its variable presentation in terms of position, orientation, and eruption status. If left undiagnosed or untreated, mesiodens can lead to several complications. The presented cases emphasize the significance of early clinical and radiographic detection, which remains crucial for preventing long-term complications and ensuring favorable esthetic and functional outcomes. Timely intervention, particularly in the mixed dentition phase, allows for more predictable outcomes and minimizes the need for complex orthodontic treatment later.

A thorough review of the literature reveals that while mesiodens is most frequently encountered in the maxillary midline, management strategies must be tailored to individual cases based on age, tooth position, and associated complications. Surgical extraction remains the most common treatment modality, especially when the supernumerary tooth interferes with the eruption or alignment of permanent teeth. Continued awareness and interdisciplinary collaboration are key to successful outcomes in managing supernumerary teeth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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