

Prevalence of mesiodens in Chennai population

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ABSTRACT

Background: A mesiodens is a supernumerary tooth located in the palatal midline between the two maxillary central incisors. The present study aimed to evaluate the epidemiological characteristics of mesiodens in the pediatric population using cone-beam computed tomography. **Materials and Methods:** A longitudinal prospective study was carried out in 5700 children to determine the prevalence of mesiodens. The following data were recorded: Age, sex, shape, orientation, eruption status, and caused by mesiodens. **Results:** The prevalence of mesiodens in the present study was 3.5%. The sex ratio was 1:1. The majority of mesiodens (61%) were conical in shape followed by supplemental (35.5%) and tuberculate (3.5%) types. A majority of the mesiodens (51.5%) were vertically aligned. Inverted and horizontal positions were observed in 41% and 7.5% of the cases. Most of the mesiodens were unerupted (53%) and 47% were erupted. **Conclusion:** The prevalence of mesiodens was 3.5%. Conical shape and vertical orientation were the common characteristics observed in the study.

KEY WORDS: Cone-beam computed tomography, Children, Mesiodens, Prevalence

INTRODUCTION

A supernumerary tooth is a developmental anomaly, characterized by the presence of tooth in addition to the normal series. It can occur as single, multiple, unilateral, or bilateral and in the maxilla, the mandible, or both. Mesiodens is the most common among various type of supernumerary teeth.^[1] The etiology of the supernumerary tooth is not known. Over the years, various theories have been suggested, which include dichotomy of the tooth bud, hyperactivity of the dental lamina, and a combination of genetic and environmental factors.^[2,3] On the basis of its morphology, mesiodens can be classified as conical, supplemental, and tuberculate type.^[3,4] However, in some cases there can be a variety of complications including impaction, delayed eruption and ectopic eruption, crowding, diastema, axial rotation, and root resorption of adjacent teeth.^[5-8] They can also cause crowding and may also be associated with pathologies like cyst.^[3] Less commonly, they may involve the permanent incisors, including root dilacerations and loss of tooth vitality.^[9]

Sometimes, mesiodens may not have any effect on dentition and can only be discovered on routine radiographs incidentally. A single occlusal or periapical film provides the most detailed picture in the incisor region while the horizontal tube shift technique is usually used to define the buccal-lingual position. However, cone-beam computed tomography (CBCT) scans may offer the three-dimensional relationship of the mesiodens to the associated teeth and near structures that are vital for treatment designing.^[10]

The purpose of this study was to detect the impacted supernumerary teeth using CBCT which were detected on panoramic radiographs.

MATERIALS AND METHODS

Ethical Approval

The study protocol was approved by the Institutional Review Board (SRB/MDS/PEDO/18-19/0010) from September 2018 to January 2019. Written informed consent to participate in the study was obtained from all study subjects and signed by their parents.

Sample Selection

A longitudinal prospective study was carried out in 5700 subjects (3200 boys and 2500 girls) of the age

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group, ranging from 4 to 15 years, who attended the Department of Pedodontics in an Educational Institute in Chennai. Selection criteria of the samples included patients who had no history of previous extraction or tooth loss due to trauma. Only those patients were included who visited the hospital for treatment of caries, gingival disease, tooth fracture, malocclusion, or routine dental checkup. Patients diagnosed with syndromes were excluded from the study. Mesiodens was recorded following clinical and radiographic examinations. Clinical examination was done under bright light using mouth mirror and number 23 explorers. Radiographic examinations include periapical radiograph of the premaxillary area, anterior maxillary occlusal radiograph, and CBCT images. The presence of supernumerary tooth, unerupted, or erupted in the palatal midline between the two maxillary central incisors was termed as mesiodens. In addition to the prevalence, the following information about the mesiodens was also recorded: Number, morphology, sagittal position, orientation, eruption status, and complications associated with it. The data obtained were subjected to statistical analysis.

RESULTS

A total of 200 patients were diagnosed as having mesiodens from 5700 samples of the pediatric age group (4–15 years). The prevalence rate was 3.5%. The majority of the cases were detected between 7 and 9 years of age [Figure 1]. The total number of mesiodens diagnosed was 200 from 5700 patients, of which 100 were boys and 100 were girls. The sex ratio was 1:1 [Table 1].

Among the 200 mesiodens, the conical shape was the most common type, accounting for 61% of the total sample [Table 2], [Figure 2]. The other two types were supplemental (35.5%) and tuberculate (3.5%).

Of the 200 mesiodens, 51.5% were in a vertical position, 41% were in an inverted position, and 7.5% were in horizontal position [Table 3]. 94 mesiodens (47%) were erupted and the remaining 106 (53%) of the cases were unerupted [Table 4].

DISCUSSION

Supernumerary teeth are developmental anomaly characterized by the existence of an excessive number of teeth in relation to the normal dental formula during the routine dental examination. Both the dentitions are affected, a higher incidence of the anomaly is observed in permanent dentition. The most frequently observed supernumerary tooth in primary dentition is lateral incisors, whereas mesiodens first prevails in permanent dentition.^[7] After different population studies, its prevalence ranges between 0.15% and 1.9%.^[11] In

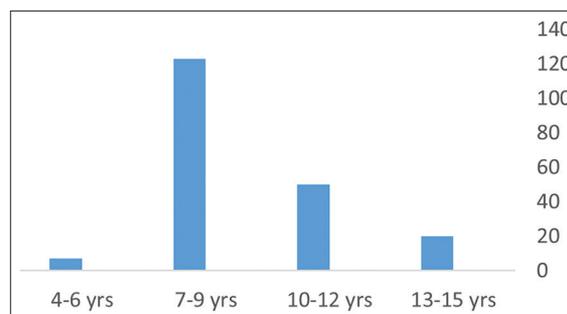


Figure 1: Distribution of mesiodens according to age group



Figure 2: Conical mesiodens

Table 1: Distribution of mesiodens by sex

Sex	n (%)
Boys	100 (50)
Girls	100 (50)
Total	200 (100)

Table 2: Type of mesiodens

Type	n (%)
Conical	122 (61.1)
Supplemental	71 (35.5)
Tuberculate	7 (3.5)
Total	200 (100)

Table 3: Orientation of mesiodens

Orientation	n (%)
Vertical	103 (51.5)
Inverted	82 (41)
Horizontal	15 (7.5)
Total	200 (100)

Table 4: Eruption status of mesiodens

Type	No. of Mesiodens	Percentage
Erupted	94	47%
Unerupted	106	53%
Total	200	100%

the present study, the prevalence of mesiodens was observed at 3.5%. The group comprised the pediatric

population and higher incidence was reported between 7 and 9 years of age. This report may be due to the maxillary central incisors, which usually erupts at this age. Radiological examination of non-eruption axial rotation of the upper central incisor or diastema might reveal the presence of mesiodens. The present study shows that boys and girls were equally affected by supernumerary teeth, the ratio being 1:1. Other studies have shown sex ratio of 2:1, favoring boys.^[2,7,12,13] The difference in sampling size and racial group examined may be the reason for the gender variation.

According to its morphology, mesiodens can be classified into conical, supplemental, and tuberculate type. Conical mesiodens is typically peg formed, with root formation ahead of or equivalent to that of the central incisor.^[3,4] Tuberculate or multicusped mesiodens is common in permanent dentition and mostly remains unerupted. This root formation is delayed to that of the adjacent teeth. This type of mesiodens usually affects the eruption of the incisors.^[14]

Supplemental mesiodens is most frequently seen in primary dentition; it resembles the tooth of the normal series and remains unerupted rarely.^[3] In the present study, conical shape was noted in the majority of the cases (61%). Liu and Gündüz *et al.* found that 46% and 55.2% of the supernumerary teeth had a normal (vertical) position axis.^[2,15]

Higher frequencies of vertically aligned (51.5%) mesiodens were observed in the present study. About three-fourth of the mesiodens remains usually unerupted and is accidentally observed during routine radiological examination.^[2,11] Mesiodens that are inverted and transversely placed never erupt into the oral cavity. In the present series, 47% of the cases were erupted. In this study, only onemesiodens occurred in all cases. This result does not support with the other studies.^[15-17]

A complete clinical and radiological examination shows management of mesiodens. Russell *et al.* suggested extraction of mesiodens within the early mixed dentition period to minimize the need for orthodontic treatment to provide proper alignment to the teeth.^[11]

According to Mitchell and Bennett observation, 70% of the permanent teeth erupted spontaneously in their samples for the study following extraction of mesiodens.^[18] Some authors have a thought that the best time for removal of mesiodens is 8–9 years of age when the upper incisors erupt. The behavior of children at this age group is far easier to manage, and the sort of anesthesia needed can be less invasive.^[2] If in case the mesiodens remains asymptomatic or if there is a higher risk of damaging the developing permanent incisors, surgery must be avoided and a periodic follow-up is required.^[13]

The role of pedodontist in managing these cases are way important because the earlier the detection; the minimal is the complication and the better the prognosis.

CONCLUSION

The prevalence of mesiodens in the pediatric population was 3.5%. The sex ratio was 1:1. The majority of the mesiodens were conical in shape, unerupted and position axis of most of the mesiodens was vertical.

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