

# PREVALENCE OF MESIODENS AMONG 6-14 YEAR OLD SCHOOL CHILDREN

## ABSTRACT

Mesiodens are considered as one of the most common supernumerary teeth. The main objective of the study was to determine the prevalence rate of mesiodens in the school going children between the age group of 6-14 years. The study shows a prevalence rate of 0.7% with sex ratio of 2:1 favouring males.

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## KEYWORDS

Mesiodens. Children. Supernumerary teeth.

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## INTRODUCTION

Mesiodens is the most common type of supernumerary tooth present in the midline between the two central incisors. It may occur as single, multiple, unilateral or bilateral.<sup>1</sup> The presence of multiple supernumerary teeth is called 'mesiodentes'.<sup>2</sup> It has been reported that in 82% of the cases it occurs in the maxilla, specifically in the premaxillary region. Only a few studies have reported the occurrence of mesiodens in the anterior region of the mandible.<sup>2-4</sup> The occurrence of mesiodens in primary dentition is quite rare but in mixed dentition and permanent dentition it is considered as the most common dental abnormality. The prevalence of supernumerary teeth in permanent dentition for the Caucasian general population has been reported between 0.1 and 3.8%, with a two-fold risk of occurrence in the male population compared to the female population.<sup>5</sup> Gender difference was also reported in some other studies. Rajab and Hamdan<sup>6</sup> reported a sex ratio of 2.2:1 in the study population of Jordanian children. A higher ratio of 6.5:1 was also reported by Davis in the occurrence of supernumerary teeth in Hong Kong children<sup>7</sup>.

Morphologically common types are conical or peg shaped, tuberculate and supplemental (tooth like) of which the conical form is the most common type. Mesiodens may erupt normally, sometimes they remain impacted or erupt in an inverted position.

Some cases of abnormal path of eruption or even take an ectopic position has been reported in the literature.<sup>5,6,8</sup> Impacted mesiodens may interfere with eruption of the other permanent teeth causing malocclusion. Mesiodens can also result in oral problems such as malocclusion, food impaction, poor aesthetics, and cyst formation.<sup>9</sup>

Treatment options includes normal extraction but surgical extraction of the mesiodens may be needed if it is impacted. If the permanent teeth do not erupt in a reasonable period after the extraction, surgical exposure and orthodontic treatment may be required to ensure eruption and proper alignment of the teeth. In somecases, fixed orthodontic therapy is also required to create sufficient arch space before eruption and alignment of the incisors.<sup>10-12</sup> Therefore early diagnosis allows the most appropriate treatment, often reducing the extent of surgery, orthodontic treatment and possible complications

## MATERIAL AND METHODS

A longitudinal observational study was conducted in 3222 school students for a period of 2 months in Kannur District of Kerala , India. Demographic data, the presence of mesiodens , their morphological charecteristics, and associated complications were recorded. All obtained data were statistically analyzed with SPSS-16.0 version (SPSS, Inc, Chicago, IL, USA)

software by using descriptive statistics and cross tabulations.

## RESULTS

A total of 23 patients were diagnosed as having mesiodens from 3222 samples of the age group 6-14 years. The prevalence rate was 0.71% (table 1). The majority of the cases were detected between 9-11 years of age (table 2). Of the 23 patients diagnosed to have mesiodens, 16 were boys and 08 were girls. The sex ratio was 2:1, favoring boys.

Most common type of mesiodens seen was conical type (figure 1). Regarding the position of the mesiodens, the majority of them were palatally placed (figure 2). Complications caused by mesiodens were axial rotation or displacement of permanent incisors (table 3).

## DISCUSSION

The first documented report of supernumerary teeth has been found in ancient human skeletal remains since the Lower Pleistocene era.<sup>13</sup> The etiology of mesiodens is unknown however, a few theories have been suggested. It is also seen as a part of a syndrome, specially cleft lip and palate, cleidocranial dysostosis and Gardner's syndrome. A genetic basis for supernumerary teeth was suggested because of a higher rate of hyperdontia among related families . The observation that supernumeraries are more

common in family members suggests heredity as an etiologic factor; however, it does not follow a simple Mendelian pattern. It has been suggested that environmental factors might have influence on genetic susceptibility.

Atavistic theory states that mesiodens represented a phylogenetic relic of extinct ancestors who exhibited three central incisors.

Another theory suggests that the supernumerary tooth is a result of dichotomy of the tooth bud; others suggest that they are the result of local independent conditioned hyperactivity of dental lamina. Association of supernumerary teeth is also seen with cysts like dentigerous cysts and odontomes. The presence of multilobed mesiodens with palatal talon cusp is also reported in the literature. The hyperactivity theory, which is the restricted increase in the activity of dental lamina, may be considered as the most acceptable etiologic factor in the development of mesiodens.<sup>14-19</sup>

The prevalence of mesiodens in the present study was 0.71%, which corresponds to the studies done by Stafne( 0.41%), Thilander (1.2%), and Clayton (0.89%), but is much lower in comparison to that of Tay (5.8%) and Khandelwal V (3.8%). The prevalence of mesiodens has been estimated to be 0.45% in Caucasians, 0.4% in Finnish, 1.43%in Norwegians, 2.2% in Hispanic populations, and 8.3% in a group of Turkish children. The prevalence of supernumerary

teeth in the permanent dentition of the Caucasian general population has been reported to be between 0.1 and 3.8%.<sup>20-24</sup>

Table 1. Prevalence of mesiodens.

Total No of subjects: 3222
Male: 1439
Female:1783
No of patients with mesiodens: 23
Prevalence of mesiodens: 0.71

Table 2. Prevalence of mesiodens in relation to age group.

	No of patients	percentage
6-8 years	5	22
9-11 years	12	52
12-14years	6	26

Figure 1. Types of mesiodens.

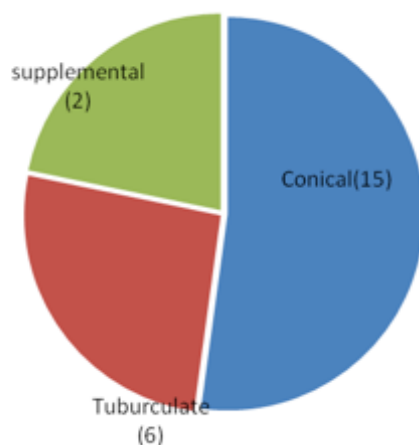
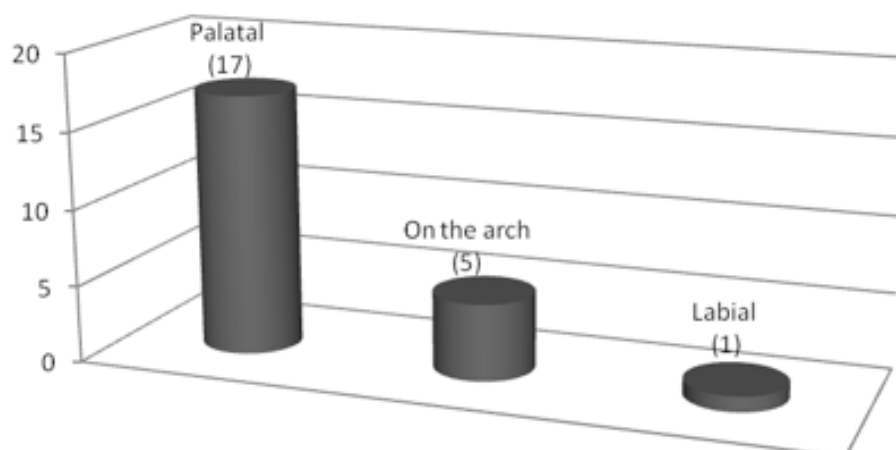


Figure 2. position of eruption of mesiodens.



Mesiodens occurs more frequently in boys than in girls.<sup>5,6</sup> In the present study, a male : female ratio of 2 : 1 was observed. As radiographs were not taken, as this was a field

survey, inverted and impacted mesiodens were excluded in this study.

Table 3. Complications of mesiodens.

TEETH	NUMBER OF PATIENTS	PERCENTAGE
Rotation of permanent	16	70
Midline diaestemma	3	14
Non eruption	2	8
Crowding	2	8

The most common complications of mesiodens are displacements of permanent maxillary incisors, crowding, diastema, non eruption of permanent tooth. Occasionally, cyst formation may happen or the tooth might erupt into the nasal cavity. Seddon et al<sup>23</sup> reported that the presence of supernumerary teeth might cause delayed eruption in 26–52% of the cases and displacement or rotation of adjacent teeth in 28% to 63% of the cases. He also reported other complications such as resorption of the adjacent roots, crowding, development of dentigerous cysts, diastema, dilaceration, and ectopic eruption of permanent teeth into the nasal cavity . literature search shows the tuberculate type of mesiodens more likely causes delay in eruption due to its position, which is mostly located palatally related to the maxillary incisors.<sup>24-26</sup> Bartolo et al<sup>19</sup> reported that 63% of patients with unerupted incisors had hyperdontia.

Clinical and radiological examination dictates management of mesiodens<sup>18</sup>.

Extraction of mesiodens in the early mixed dentition stage is the best treatment option available for alignment of teeth and minimizing the need for orthodontic treatment. According to Mitchell<sup>26</sup> observation, 70% of the permanent teeth included in their study sample erupted spontaneously following extraction of the mesiodens. Some authors believe that the best time for removal of mesiodens is 8-9 years of age when the upper incisors erupt<sup>27,28</sup>. At this age, behavior of a child is much easier to manage .Different methods for extraction of mesiodens are there in literature ; early extraction before root formation of the permanent incisors and late extraction after root formation of the permanent incisors<sup>19</sup>.

Some authors recommend extraction of mesiodens in the early mixed dentition in order to facilitate spontaneous eruption and alignment of the incisors.<sup>29</sup> In order to promote

eruption and proper alignment of adjacent teeth, it is recommended to extract mesiodens in the early mixed dentition, which may reduce the need for orthodontic treatment. It might take six months to three years for an unerupted tooth to erupt after removal of the mesiodens<sup>30</sup>. Henry and Post<sup>31</sup> suggested delayed extraction of the unerupted mesiodens about the age of 10 when the apex of the central incisor nearly forms. If treatment is postponed after this age, more complex surgical and orthodontic treatment may be necessary. The type and position of the unerupted tooth, the space available in the dental arch, in addition to the stage of root development may influence how long it takes for an impacted tooth to erupt after surgical removal of the mesiodens.<sup>32-34</sup>

### CONCLUSION

Routine check up during the primary dentition and mixed dentition stages helps for early detection of mesiodens and other anomalies. Early diagnosis and treatment helps in minimising future complications and prognosis are better. In case of any alteration in the eruption path of the central incisors or even asymmetric eruption, the clinician must evaluate the possibility of an extra tooth.

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