

# The prevalence of mesiodens in Iranian children: A radiographic study

Ghasem Mighani DMD,MS

**Introduction:** Mesiodens is the most common supernumerary tooth occurring in 0.15% to 1.9% of The population. A racial variation is believed in the prevalence of supernumeraries. The purpose of This cross-sectional study was to determine the prevalence of mesiodens.

**Materials and Methods:** 2687 Iranian children 6-9 years old were selected and peripical radiographs were taken.

**Results:** The general prevalence of mesiodens was found to be 1.6% (1.11 , 2.08). Males showed a higher prevalence of mesiodens than that of females;5:10.

**Conclusion:** A maxillary occlusal radiograph is highly recommended to make clear The presence or absence of supernumerary teeth.

The most common supernumerary tooth is the mesiodens which lies between the maxillary central incisors.<sup>1-4</sup> Selection of different groups of study subjects have contributed to reported differences in prevalence.<sup>2-6</sup>

The prevalence of hyperdontia is reportedly between 0.15% and 3.9%.<sup>1</sup> 90-98% of supernumerary teeth occur in maxilla with a particular predilection for the premaxilla(90%).<sup>5,7,11</sup>

The overall prevalence of mesiodentes is between 0.15% and 1.9%.<sup>1,2,5</sup> while the prevalence among primary teeth is 0.03-1.9%.<sup>11</sup> There seems to be a racial variation in the prevalence of supernumeraries , with a frequency higher than 3% in Mongoloid races.<sup>6,7</sup> One-third of all patients with a mesiodens also have other supernumerary teeth.<sup>1</sup> Studies of the prevalence of mesiodens involving certain ethnic or racial population, including Scandinavians, Hispanics, Japanese, and Chinese have been published.<sup>6,8</sup>

In Caucasian population the incidence of mesiodens is evaluated at 0.3% and 0.8% for deciduous teeth and between 0.15% and 3% for permanent teeth, and is most frequently found in males with respect to females by the proportion of

2:1.9 Given this high frequency, the general dentist should be knowledgeable about the signs and symptoms of mesiodens and appropriate treatment.<sup>1</sup>

Supernumerary teeth can cause a number of alterations, including displacement of the adjacent teeth, anomalous or delayed eruption of the permanent teeth, median diastema, cyst formation, occlusal problems etc.<sup>4, 5-9, 19,20</sup> Most mesiodens never erupt.<sup>2</sup> According to Primo et al. the frequency of these erupted teeth was 47.14%, while at non erupted was 52.86%.<sup>10</sup> These unerupted teeth may cause pressure root resorption and damage to the pulp of the permanent teeth.<sup>9,24</sup>

Recognition of dental anomalies is essential in determining appropriate treatment for each patient.<sup>1,11</sup> The diagnosis may be made at an early stage, namely during deciduous dentition.<sup>9, 10</sup> Diagnosis of premaxillary hyperdontia may be secured at the age of six years. Therefore, early diagnosis and early extirpation have been recommended.<sup>10,19</sup> Identification in some instances is purely coincidental, usually the result of evaluation of radiograph taken for other reasons.<sup>12</sup> Radiographic examination may disclose the number, direction and location of mesiodens and their defects on neighboring teeth.<sup>13</sup> Because some supernumerary teeth may be embedded and asymptomatic, complete radiographic survey is required for their detection.

Table 1 shows the prevalence of supernumerary teeth in

Assistant Professor, Dept. of  
Pediatric dentistry,  
Tehran University of Medical Sciences (TUMS)

**Table 4.** Prevalence of supernumerary teeth in various population groups

Author(s)	Year	Size of sample	Age group	No. of patients	percent	No. Of teeth	Male/female ratio
Stafne	1932	48,550	all	198	0.41	246	---
Byrd	1943	2835	4-14	----	0.52	----	1.1
Clayton	1956	3557	3-12	----	1.90	----	0.9
Lind	1959	1.716	children	49	2.86	----	2.3
Walifelt	1961	22,188	all	112	0.50	----	2.1
Granen&al	1961	1173	3-5	----	0.3	----	1.1
Lacoste&al	1962	3,000	children	42	1.40	43	----
Keil&Speth	1963	3,400	all	13	0.38	14	----
Randle	1967	1,558	1-9	32	2.05	36	1.4
Luten	1967	1558	1-9	----	2.0	---	0.95
Mckibben	1971	1500	3-12.5	23	1.5	28	1.0
Ravn	1971	4,564	3-3.5	90	1.9	30	0.83
Ravn&Nielsen	1973	1,530	6-13	13	0.85	13	2.3
Thilander & al	1973	6,398	7-13	77	1.20	----	----
Jarvinen	1976	604	7	10	1.66	11	0.9
Bodin	1978	21609	all	344	1.59	422	1.7
Heling	1980	28000	6-14	83	0.3	39	----
Hurlen	1984	2043	children	25	1.20	32	1.7
Grover	1984	5000	17-26	68	1.36	85	1.0
Tay	1984	----	6-9.5	204	----	274	5.4
Huang	1992	1869	2.5-7	543	----	39	2.55
Backman	2001	739	7	14	1.9	---	1.3



this region reported by other studies. According to the reports, the prevalence of the anomaly ranges from 0.3 to 2.86%, and is considerably higher than that reported in other studies on which clinical examinations were made without radiographic surveys.

The objective of this paper was to estimate the prevalence of mesiodens in Iranian school children.

### Material and method

The study population consisted of 2,687 healthy school children aged from 6-9 years were randomly selected by two stages cluster sampling. 1,128 girls and 1,559 boys. The characteristics of mesiodens were obtained from radiographs results. Author analyzed the radiographs of 2,687 students born in Tehran and aged between 6-9 years to determine the prevalence of mesiodens at the Department of Pediatric Dentistry, Dental Faculty University of Tehran Medical Sciences. Parents of these subjects had signed voluntary inform consent sheets for radiography examination. Furthermore, for protection against any unwanted radiation, they had worn lead apron sheets. The radiographic examination (periapical technique) was made. General Electric GE 100X-ray machine was made for the intraoral radiographs. All films were of standard commercial types and were processed following standard procedures. Radiograph films

**Table 2.** Distribution and prevalence of mesiodens in children 6-9 years by gender

Sex	No. At risk	Affected	(%)	(%)	Total	Prevalence
Female	1123	99.5	5	0.5	1128	0.05 to 0.83
Male	1521	97.5	38	2.5	1559	1.64 to 3.22
Total	2644	98.4	43	1.6	2687	1.11 to 2.08

**Table 4.** Distribution of mesiodens in children 6-9 years when parents have had family relation before Marriage

their parents.

Anomaly	Relative				Total	Prevalence
	Positive	%	Negative.	%		
Positive	6	3.1	192	96.9	198	0.55 to 5.50
Negative	37	1.5	2451	98.5	2488	0.99 to 1.97

**Table 3.** Distribution of mesiodens in children 6-9 years as related to age

Age	No	At risk (%)	Affected (%)	Total	95% CI for prevalence	
6	512	97.7	12	2.3	524	0.97 to 3.61
7	889	98.5	13	1.5	902	0.64 to 2.24
8	920	98.8	11	1.2	931	0.46 to 1.9
9	323	97.8	7	2.2	330	0.51 to 3.73

were analyzed according to the parallax rule.

### Results

Study subjects were 1,128 girls and 1,559 boys. As shown in Table 2, of 2,687 subjects, 43 mesiodens were exhibited with a prevalence of 1.6 percent. (fig1 and 2) There was significant sex difference. The records showed that mesiodens occurred five times more frequently in boys than girls (prevalence of 2.5 in boys and 0.5 in girls). In this study the distribution of location was 22 central incisors which were erupted; the mesiodens prevalence estimated from 1.64% to 3.22% in favor of the boys; 40 patients (93%) had single mesiodens and the 3 children had two mesiodens (7%); in no case did inquiry disclose a history of removal of supernumeraries prior to the investigation.

Table 3 shows the prevalence of mesiodens by age groups. Higher prevalence was found in children aged 6 year whereas lower prevalence was for 8-year children. Chi-square test showed no statistically significant difference between age and mesiodens prevalence. Although the prevalence of mesiodens was higher in children with relative marriage of parents compared with non-relative, this relationship was not statistically significant (Table4).

No pronounced difference was found between the right and the left sides. About 23% of the mesiodens were in the





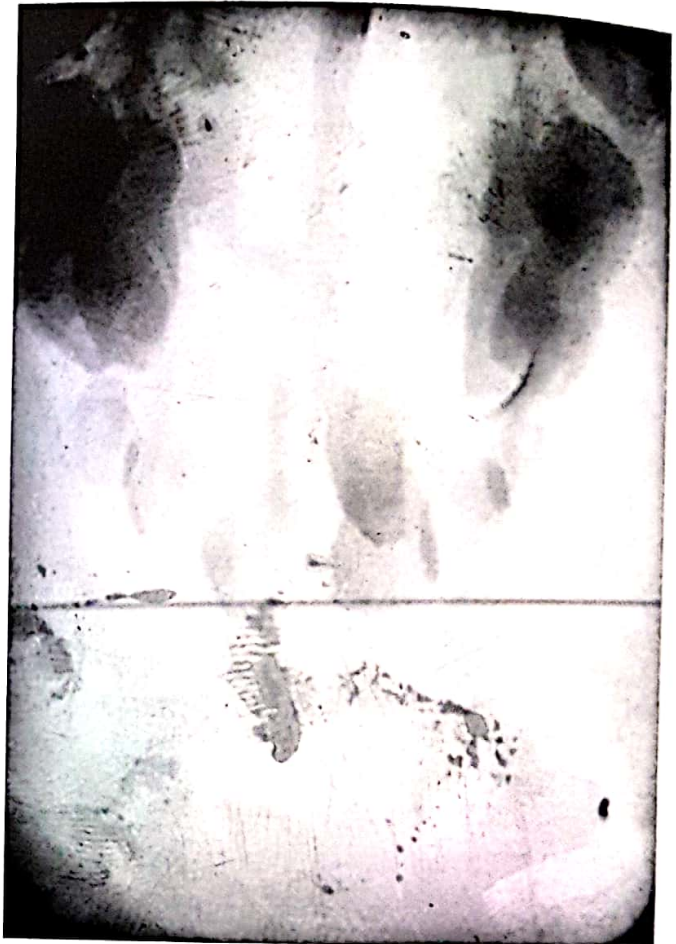
**Fig 1.** The mesiodens is in the upward position toward the floor of the nasal cavity.

upward position toward the floor of the nasal cavity (Fig. 1). A relatively large proportion of mesiodens (53.4%) had an inverted position. The crown pointing had a cranial direction. The remaining mesiodens stood in a more or less upright position, but with varying degrees of inclination. In 12 cases (28%) the mesiodens caused displacement of the median palatal suture.

In 22 patients (51%) with mesiodens eruption of permanent incisors had not occurred. Only in 4 patients (9.3%) anterior permanent teeth were erupted. In 38 patients (88.3%) the mesiodens were impacted and 53.4% were upside (Fig. 2). In 21 of the 43 mesiodens (49%), root development was completed; but in the remaining no signs of root formation could be seen. The degree of development relative to that of neighboring normal tooth differed also.

### Discussion

Most supernumerary teeth usually remain unerupted or asymptomatic.<sup>7,10</sup> They are commonly discovered during routine radiographic examination.<sup>14,18</sup> Direct comparisons cannot be made in frequency studies of supernumerary teeth recorded by other workers, but general agreement was found



**Fig 2.** Mesiodens

in the male/female ratio.<sup>16</sup> Most studies show that boys are involved nearly twice as often as girls.<sup>17</sup> A sex ratio as high as 5.5:1 favoring males has been reported on the maxillary anterior supernumeraries of Japanese school children.<sup>7</sup> Yonezu reported 0.37% supernumerary teeth in Japanese three-year-old children.<sup>27</sup> Salem showed 0.50% supernumerary teeth in 2393 Saudi children.<sup>28</sup> Kim showed that males affected approximately 4 times as frequency as females in Korean 4-26 years.<sup>3</sup> The anomaly was prominent in the male with a sex ratio of 5.4:1 among Hong Kong school children.<sup>7</sup> The male/female ratios in Scandinavian children ranged from 0.9:1<sup>15</sup> to 2.4:1.<sup>19</sup> Grahnen and Linahl found no significant difference between sexes in the incidence of supernumerary teeth.<sup>23</sup> The higher frequency of mesiodens in children of oriental than in children of occidental origin may be associated to the higher prevalence of consanguineous marriages in the oriental communities.<sup>25</sup>

As reported by other workers, the present study did find significant differences between the sexes with respect to the prevalence of mesiodens (5:1). Sex predilection of male over female agreed with most studies.<sup>6</sup> Discrepancy could be related to factors such as the population, the nature of the radi-



ographic survey employed, or genetic background of the population under examination.<sup>8, 13</sup> Among a total of 2,687 subjects aged 6-9 years, there were 43 subjects affected. In this study, significant difference was not found between occurrence of mesiodens and familial relation.

This survey is a cross sectional study of 2,687 children from a community, demographically considered representative for the population of Iranian children. The prevalence of mesiodens was 1.6%. Among 2,687 subjects whose periapical radiographs were examined for congenital dental anomaly 43 were affected with one or two mesiodens. But in many of studies the frequency of the mesiodens had not been separated.<sup>20</sup> The prevalence of hyperdontia in 739 Swedish children was 1.9% (11 girls and 3 boys)<sup>20</sup> Bergstrom, found among 2,589 eight to nine years old children systematically examined by panoramic radiography, 38 cases of hyperodontia (1.5% among boys and 0.9% among girls).<sup>20</sup> Bodin et al. found the total frequency of hyperdontia to be 16 per mille, agreeing with the finding of Lind. In the comprehensive study of Bodin et al. this proportion in Scandinavian children was 1.2% to 2.9%.<sup>19, 20</sup> Heling reported in 28,000 children 6-14 years, however, radiographs were not always taken, 39 supernumerary teeth were found.<sup>15</sup> Ravn among 4,564 children 3-3.5 years showed that hyperdontia occurred in 0.5%.<sup>22</sup> Studies in Eskimos indicate an incidence of 0.77%.<sup>21</sup> Huang et al showed among 543 Chinese patients, an average of 1.3 mesiodens per person.<sup>6</sup>

In Iranian children the prevalence of mesiodens is similar with Asian reported studies. Beside racial differences, age composition of the subjects and examination methods are the most important factors influencing the results.<sup>6</sup> The difference between reported studies may be related to the deliberate exclusion from the present study of all patients with skeletal or systemic disturbances likely to be associated with oral manifestations. The higher prevalence of supernumerary teeth and mesiodens reported to occur among children suffering from defects such as craniofacial dysostosis and cleidocranial dysostosis may have influenced the reported figures.<sup>8</sup> However, there were differences in selection of the materials as well as in the methods used for assessing the anomaly.<sup>19</sup>

The surprisingly high prevalence found stresses the need for thorough radiographic evaluation of all preschool age children and lends support to the recent recommendations that intraoral radiographs should be used in examining child patients.

The important radiographs were to locate supernumerary teeth from one population to the other may exist, but these differences are hardly expressed by comparison of prevalence found in surveys. Furthermore, the rarity of the anomaly requires a rather large sample of the population to obtain reliable prevalence values.

The present study indicated that mesiodens in the premaxillary region are detectable at the age 6 years. Generally mesiodens is located palatally to the central incisors.<sup>1</sup> Radiographic determination of the exact position of the supernumerary teeth, and its interrelationship with the teeth involved, are important in deciding whether and when the supernumerary tooth should be removed. Occlusal projections are often suggested not only to identify the morphology and number of the mesiodens, but also to better define the position in relation to the vestibule and tongue and also to define the relationship with the adjacent bone structures.<sup>6, 9</sup> There is no doubt that greater detailed concerning the location can be obtained through Computerized Axial Tomography, which can precisely locate the excess tooth and evaluate the relationship with the neighboring teeth structures.<sup>9</sup>

## Conclusion

Mesiodens was diagnosed through radiographic examination using maxillary anterior occlusal and periapical views. A maxillary occlusal radiograph is highly recommended for all children prior to the exfoliation of the primary anterior teeth, at approximately age five or six, to ensure that no supernumerary teeth or other anomalies are present (Rotberg and Kopel 1984). An early diagnosis allows early intervention, favorable prognosis and minimal complications. If a mesiodens is detected in a child, then the dentist must decide whether immediate surgical intervention is required.

## Acknowledgments

We would like to thank Dr. J. Mahmodian, and Dr. A. Kowsari Department of Pediatric Dentistry, Faculty of Dentistry, University of Tehran Medical Sciences, for their assistances in this study.

## References

1. Russell KA, Folwarczna MA. Mesiodens--diagnosis and management of a common supernumerary tooth. *J Can Dent Assoc.* 69: 362-6, 2003. Review.
2. Diekmann SL, Cohen DM, Gutz DP. Ectopic soft-tissue mesiodens. *Oral Surg Oral Med Oral Pathol.* 53: 391-4, 1982.
3. Kim SG, Lee SH. Mesiodens: a clinical and radiographic study. *J Dent Child (Chic).* 70: 58-60, 2003.
4. Folio J, Smilack ZH, Roberts MW. Clinical management of multiple maxillary anterior supernumerary teeth: report of case. *ASDC J Dent Child.* 52: 370-3, 1985.
5. Primosch RE. Anterior supernumerary teeth--assessment and surgical intervention in children. *Pediatr Dent.* 3: 204-15, 1981.
6. Huang WH, Tsai TP, Su HL. Mesiodens in the primary dentition stage: a radiographic study. *ASDC J Dent Child.* 59: 186-9, 1992.
7. Tay F, Paug A, Yuen S. Unerupted maxillary anterior supernumerary teeth: report of 204 cases. *ASDC J Dent Child.* 51: 289-94, 1984.
8. McKibben DR, Brearley JJ. Radiographic determination of the prevalence of selected dental anomalies in children. *ASDC J Dent Child.* 28: 390-8, 1971.
9. Giancotti A, Grazzini F, De Dominicis F, Romanoni G, Arcuri C. Multidisciplinary evaluation and clinical management of mesiodens. *J Clin Pediatr Dent.* 26: 233-7.

- 2002 .
10. Chevotarese AB, Tavares CM, Primo I. Clinical complications associated with supernumerary teeth: report of two cases. *J Clin Pediatr Dent.* 28: 27-31, 2003.
  11. Atwan SM, Turner D, Khalid A. Early intervention to remove mesiodens and avoid orthodontic therapy. *Gen Dent.* 48: 166-9, 2000.
  12. Hennis I, Lotz G, Schienbein H. [Supernumerary teeth in the maxillary anterior region with special reference to odontoids (II)] *Quintessenz.* 34: 2167-76, 1983.
  13. von Arx T. Anterior maxillary supernumerary teeth: a clinical and radiographic study. *Aust Dent J.* 37: 189-95, 1992.
  14. Kessler HP, Kraut RA. Dentigerous cyst associated with an impacted mesiodens. *Gen Dent.* 37: 47-9, 1989.
  15. Cangialosi TJ. Management of a maxillary central incisor impacted by a supernumerary tooth. *J Am Dent Assoc.* 105: 812-4, 1982.
  16. Kinross MJ. Unerupted premaxillary supernumerary teeth. A study of their occurrence in males and females. *Br Dent J.* 3: 153: 110, 1982.
  17. Hogstrom A, Andersson L. Complications related to surgical removal of anterior supernumerary teeth in children. *ASDC J Dent Child.* 54: 341-3, 1987.
  18. Stermer Beyer-Olsen EM, Hurlen B, Humerfelt D. Changing positions of supernumerary teeth in the premaxilla: a radiographic study. *ASDC J Dent Child.* 52: 428-30, 1985.
  19. Hurlen B and Humerfelt D: Prevalence of premaxillary supernumerary teeth in Norwegian children: A radiographic study. *Dentomaxillofac. Radiol.* 13: 109-115, 1984.
  20. Bodin I, Julin P, Thomsson M. Hyperodontia. I. Frequency and distribution of supernumerary teeth among 21,609 patients. *Dentomaxillofac Radiol.* 7: 15-7, 1978.
  21. Sedano HO, Gorlin RJ. Familial occurrence of mesiodens. *Oral Surg Oral Med Oral Pathol.* 27: 360-1, 1969.
  22. Ravn JJ. Aplasia, supernumerary teeth and fused teeth in the primary dentition. An epidemiologic study. *Scand J Dent Res.* 79: 1-6, 1971.
  23. Grover PS, Lorton L. The incidence of unerupted permanent teeth and related clinical cases. *Oral Surg Oral Med Oral Pathol.* 59: 420-5, 1985.
  24. Foley MF, Del Rio CE. Supernumerary teeth. Report of a case. *J Oral Surg Oral Med Oral Pathol.* 30: 60-3, 1970.
  25. Ilana Heling, Murray Shekter: Multiple Impacted Supernumerary Teeth. *Quintessence international.* 7, 85-87, 1980.
  26. Backman B, Wahlin YB. Variations in number and morphology of permanent teeth in 7-year-old Swedish children. *Int J Paediatr Dent.* 11: 11-7, 2001.
  27. Yonezu T, Hayashi Y, Sasaki J, Machida Y. Prevalence of congenital dental anomalies of the deciduous dentition in Japanese children. *Bull Tokyo Dent Coll.* 38: 27-32, 1997.
  28. Salem G. Prevalence of selected dental anomalies in Saudi children from Gizan region. *Community Dent Oral Epidemiol.* 17: 162-3, 1989.