## Original Article

# Evaluation of prevalence of mesiodens in panoramic images of 6-12 years old children referred to Sari Dental School during 2013-2019

Haleh Hali 1, Forouzan Farahbod 2, Mahmood Moosazadeh 3, Mehdi Azami4*

1. Department of Pediatric Dentistry, Faculty of Dental, Mazandaran University of Medical Sciences, Sari, Iran.
2. Department of Oral and Maxillofacial Radiology, Faculty of Dental, Mazandaran University of Medical Sciences, Sari, Iran.
3. Ph.D. in Epidemiology, Mazandaran University of Medical Sciences, Sari, Iran
4. Dentistry Student, Faculty of Dentistry, Mazandaran University of Medical Sciences, Sari, Iran.

**Corresponding Author: Mehdi Azami**- Dentistry Student, Faculty of Dentistry, Mazandaran University of Medical Sciences, Sari, Iran. azamimehdi@yahoo.com. https://orcid.org/0000-0002-4570-6192.

## Abstract

**Introduction**: Mesiodens are supernumerary tooth between the two central incisors. Mesiodens are usually responsible for eruption disturbances, midline diastema, crowding and finally root resorption of adjacent teeth. The aim of this study was to evaluate the prevalence of mesiodens in the panoramic images of 12-6-year-old children referred to Sari Dental School.

**Methods**: This cross-sectional study evaluated all radiographs of 6-12 year-old children referred to pediatric department of Sari Dental School. Radiographic examination of mesiodensis included the presence and number of mesiodensis.

**Results**: Mesiodensis was observed In 6 cases (0.6%) of the studied population. In each case only one mesiodens was observed and 5 of them male and only one was female. The difference in the prevalence of mesiodensis was statistically significant in both sexes (P-value =0.025) But there was no significant relationship between the prevalence of mesiodenes and age (P-value =0.444).

**Conclusion**: Despite the low prevalence in this population, approximately 90% mesiodens has been associated with dental problems therefore early diagnosis and treatment is recommended.

**Key words**: Supernumerary teeth, Mesiodense, Panoramic Radiography.

Submitted: 29 March 2020, Revised: 1 May 2020, Acepted: 29 May 2020

## Introduction

Different types of dental malformations associated with defects in dental development are caused by hereditary, systemic, traumatic, or localized factors. Abnormalities are classified in terms of number, size, shape, structure, and color of teeth (1).

The change in the number of teeth is due to problems that occur during the early stages or stages of dental septum development (2). In addition to inherited patterns which leads to extra or missing teeth, physical disruption of the dental septum, overactive dental septum, and failure to induce dental septum by ectomenzymes are several examples of etiological factors affecting the number of teeth (3).

Hyperdontia Or extra teeth are words to describe an increase in the number of teeth that can occur in both a series of deciduous or permanent teeth. The most common overgrowth of the tooth is mesiodens, which occurs in the midline of the palate and can take many forms and positions relative to the adjacent tooth (4). Dental abnormalities include changes in the number, size, growth, and shape of teeth that are divided into both evolutionary and acquired abnormalities, and the term evolutionary indicates that a particular abnormality has occurred during tooth or tooth formation which most of them are hereditary defects (5). Equivalent vocabulary or related to extra teeth includes hyperdontia, distodens, mesiodens, and peridense(6). Supernumerary teeth are teeth that like natural teeth develop from

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

Dental Lamina. The shape of these teeth may be normal or abnormal (7). The outbreak of extra teeth is reported to be 1 to 4 percent, and is more common in Asian and Native Americans, and also in men than women. Although they are found in both dental systems, they are more common in the permanent dental system (8). Mesiodens refers only to the extra teeth in the middle of the Maxilla, which are located between the two central teeth. Masiodens can be single or multiple and can cause growth disorders of incisor teeth (9). The masiodens is usually seen as a latent tooth with a conical crown and a single root, and is sometimes found upside down (10).

Mesiodens is diagnosed by clinical and radiographic tests of the anterior region of the maxilla (6). In addition, maxillary occlusal radiography is widely recommended for all children with dental malformations in the maxillary perineum (10). In many specimens, mesiodens is associated with dental growth disorders, diastasis, rotational rotation, or deviation of permanent incisor teeth, or disorders such as analysis in adjacent teeth and the spread of dentis jerus cysts (10-12).

In various studies, the frequency of mesiodens is reported to be in the Caucasian population 0.45%, in the Finnish population 0.4%, in the Norwegian population 1.43%, in the Spanish population 2.2%, in the Bengali population 0.8%, 0.05% in Japanese individuals, 0.13% to 0.77% in India, 1.2% in Turkey and 1.6% in Iran (Tehran) (22-23)

Given that the prevalence of mesiodens varies in different populations and races, and given that the presence of mesiodens can stop permanent teeth growth and cause occlusal problems, it is helpful to know the extent of mesiodens in order to perform the correct treatment process. This study was conducted to investigate the prevalence of mesioden in panoramic images of children aged 6-12 years who referred to Sari School of Dentistry during the years of 1992-98.

## Materials and Methods

This has been a descriptive-cross-sectional study. According to the aim of the study, which was to investigate the outbreak, the census method was used for the sample size without sample size (23). This study was performed with panoramic radiographs in the radiology department of Mazandaran University of Medical Sciences and the Children's Research Society, with childrens aged 6 to 12 years who referred to the clinic of Sari School of Dentistry in the period 1392-1398.

The criterion for entering this study was children aged 6-12 years who referred to Sari Dental School during the years 1992-98, and children with syndromic children were excluded from the study with the possibility of multiple teeth that increase the number of false teeth. All available panoramic radiographs were examined according to the input and output criteria.

For each of the graphs, a checklist of information such as the number of maxillofacial teeth and the sex of the individuals was recorded. A final year dental student, under the supervision of an oral, maxillofacial and radiologist, as an observer, examined radiographs simultaneously. The collected information was recorded and entered in SPSS ver 16 software and analyzed. Data were described in terms of average percentage, mean, standard deviation and quadrant. Comparison of the prevalence of mesiodens in terms of sex was presented with Chi-Square test and Fisher exact test. The significance level was also considered to be 0.05.

## Results

A total of 970 panoramic radiographs were examined in this study. Chi-score test and Mann-Whitney test were used for the study

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

of the relationship between qualitative and quantitative variables, respectively. As shown in Figure 1, 378 samples (39%) were male and 592 samples (61%) were female. In addition, 493 samples (50.8%) were in the age range of 6-9 years and 477 samples (49.2%) were in the age range of 10-12 years.

Of the 970 radiographs examined, only 6 cases (0.6%) were observed with mesiodens, and 964 samples (99.4%) lacked mesiodens teeth. The table below shows the distribution of mesiodens in both males and females. Five of the individuals had male mesiodens, and only one in six had female mesiodens. The relative ratio of mesiodens in men to women is 6.5 to 1.

According to the Chi-Square test, there is a statistically significant relationship between the two variables of sex and mesiodens. (P-value = 0.025). Results show that mesiodens are more common in men than in women.

The distribution of mesiodens in the age groups of 6-9 years and 10-12 years can be seen in Table 3.

Based on Fisher exact test, no statistically significant relationship was observed between the two variables of age groups and mesodance. (P-value=0.444)

The results of the Mann-Whitney test showed that there was no significant age difference between the two groups, having and not having mesiodens. (P-value=0.309)

## Discussion

Of the 970 radiographs examined, only 6 cases (0.6%) were observed with mesiodens, and 964 samples (99.4%) lacked mesiodens teeth. In various studies, frequency (prevalence) of mesiodens has been reported between 0.05 and 3.18 (13, 14, 19, 20, 24-30) and the result of the present study is in the same range. The differences in the frequency (prevalence) of mesiodens in studies can be attributed to racial, genetic, and geographical differences. A 2017 study by Kaur et al. (31) found a similar mesiodense frequency (prevalence) to our study. In their study, the frequency (prevalence) of mesiodens was 0.67%. A similar study conducted at the same province at Babol University of Medical Sciences found mesiodense frequency of a 1%. Due to racial similarity, this difference can be attributed to the difference in the number of samples examined.

One of the most important factors in epidemiological studies is gender. Basically, many evolutionary anomalies tend to be prone to one of the two sexes. In this study, 5 cases of people had male mesiodens teeth and only 1 case in 6 cases had female mesiodens. According to the Chi-Square test, there is a statistically significant relationship between the two sex variables and mesodynamics. The result of this study shows P-value of 0.025 which is in aggreement with the the study of Mahmoudian and coworkers, ÇOLAK and coworkers in Turkey, and the studies conducted in Southeast Asia (China and Japan). Therefore, young male children need more attention regarding this mesiodens disorder.

In this study, the proportionality of mesiodens in men compared to women was reported to be 6.5 to 1. In the study of Abbasi and coworkers (32), the frequency (prevalence) of mesiodens in boys was found to be 1.2 to 1 compared to girls. This ratio was reported 1.57 to 1 by sulabha et al. (27), 1.78 to 1 by Mukhopadhaya et al. (21), 1.8 to 1 by Celickoglu et al. (19), 2.1 to 1 by Gunduz et al. (22), 1.5 to 1 by Kazanci (29), 1.2 to 1 by Khandelwa (9), and 1.5 to 1 by Lara et al. (30). The difference in different studies is due to racial differences and the study of different populations.

In most cases, the mesiodense teeth remain latent. In the study of Mahmoudian et al.

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

(23), 88.3%, ÇOLAK et al. (28), 53.3%, and Kazanci et al. (29), 66.7% of the teeth were latent. In the present study, 16.66% of cases (1 sample) of mesiodens was not latent. However, in the study of sulabha, the higher frequency, about 63.6% , of fully grown teeth was reported (27). A study by Abbasi et al. (32), 15% of cases of was observed with fully grown mesiodense, which is similar to the present study. This can be attributed to the demographic similarity of these two studies.

As expected, according to the Chi-Square test, the frequency (prevalence) of anomalies did not show a significant difference relative to age(P-value = 0.444), which is consistent with other studies such as the study of Mahmoudian and his colleagues (23) and Abbasi and colleagues(32).

Therefore, it is recommended that radiographs and regional examinations be performed at the earliest opportunity at the age of about 6 years which is at the same time as the deciduous centers fall and permanent anterior teeth start to grow. In this way, with the timely diagnosis of the necessary treatments, the spread of the complications caused by the presence of extra teeth will be prevented.

It is recommended that a proper examination at different ages and, if necessary, a panoramic radiograph be performed to screen for dental malformations in order for timely diagnosis, and a lower-cost treatment plan in a shorter course of treatment. Providing information through education and schools can definetly help in this process.

## Conclusion

As a result of this study, it can be stated that the mesiodense frequency is low. However, due to economic burden, and the potential dental problems that can occur even after treatment, timely diagnosis and early treatment are recommended.

## Acknowledgement

Hereby, we deeply appreciate Mazandaran University of Medical Sciences for the support and cooperation in this dissertation

## References

1. Gallas MM, Garcia A. Retention of permanent incisors by mesiodens: a family affair. British dental journal. 2000;188(2):63-4.
2. Fernández Montenegro P, Valmaseda Castellón E, Berini Aytés L, Gay Escoda CJMO, Patología Oral y Cirugia Bucal, , vol. 11, num. 4, p. 339-344. Retrospective study of 145 supernumerary teeth. 2006.
3. Tyrologou S, Koch G, Kurol J. Location, complications and treatment of mesiodentes-a retrospective study in children. Swed Dent J. 2005;29(1):1-9.
4. Miresmaeili A, Farhadian N, Tadjbakhsh M. The prevalence of mesiodens in Iranian children: a radiographic study. Iran J Orthod. 2006;1(1):31-6.
5. Primosch RE. Anterior supernumerary teeth-assessment and surgical intervention in children. 1981;3(2):204-15.
6. White SC, Pharoah MJ. Oral radiology-E-Book: Principles and interpretation: Elsevier Health Sciences; 2014, p. 624-629.
7. Liu JF. Characteristics of premaxillary supernumerary teeth: a survey of 112 cases. ASDC journal of dentistry for children. 1995;62(4):262-5.
8. Wimalarathna AK. Non-syndromic multiple unerupted supernumerary teeth. Journal of the Postgraduate Institute of Medicine. 2016;3(24):1-5.
9. Khandelwal V, Nayak A, Naveen R, Ninawe N, Nayak P, Prasad SS. Prevalence of mesiodens among six-to seventeen-year-old school going children of Indore. Journal

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

of Indian Society of Pedodontics and Preventive Dentistry. 2011;29(4):288.
10. Russell KA, Folwarczna MA. Mesiodens-diagnosis and management of a common supernumerary tooth. Journal-Canadian Dental Association. 2003;69(6):362-7.
11. Hyun HK, Lee SJ, Lee SH, Hahn SH, Kim JW. Clinical characteristics and complications associated with mesiodentes. Journal of oral and maxillofacial surgery. 2009;67(12):2639-43.
12. Giancotti A, Grazzini F, De FD, Romanini G, Arcuri C. Multidisciplinary evaluation and clinical management of mesiodens. The Journal of clinical pediatric dentistry. 2002;26(3):233-7.
13. Leco Berrocal M, Martín Morales JF, Martínez González JM. An observational study of the frequency of supernumerary teeth in a population of 2000 patients. Medicina Oral, Patología Oral y Cirugía Bucal (Internet). 2007;12(2):134-8.
14. Huang W, Tsai T, Su H. Mesiodens in the primary dentition stage: a radiographic study. ASDC journal of dentistry for children. 1992;59(3):186-9.
15. Asaumi J-I, Shibata Y, Yanagi Y, Hisatomi M, Matsuzaki H, Konouchi H, et al. Radiographic examination of mesiodens and their associated complications. 2004;33(2):125-7.
16. Buenviaje TM, Rapp R. Dental anomalies in children: a clinical and radiographic survey. ASDC journal of dentistry for children. 1984;51(1):42.
17. Järvinen S, Lehtinen L. Supernumerary and congenitally missing primary teeth in Finnish children: an epidemiologic study. Acta Odontologica Scandinavica. 1981;39(2):83-6.
18. Sulabha A, Sameer C, Umesh K, Warad N. Mesiodens: A radiographic study among the children of Bijapur, India. Journal of Advanced Oral Research. 2012;3(3):13-7.
19. Celikoglu M, Kamak H, Oktay H. Prevalence and characteristics of supernumerary teeth in a non-syndrome Turkish population: associated pathologies and proposed treatment. Med Oral Patol Oral Cir Bucal. 2010;15(4):e575-8.
20. Meighani G, Pakdaman A. Diagnosis and management of supernumerary (mesiodens): a review of the literature. Journal of dentistry (Tehran, Iran). 2010;7(1):41.
21. Mukhopadhyay S. Mesiodens: a clinical and radiographic study in children. Journal of Indian Society of Pedodontics and Preventive Dentistry. 2011;29(1):34.
22. Gündüz K, Çelenk P, Zengin Z, Sümer P. Mesiodens: a radiographic study in children. Journal of oral science. 2008;50(3):287-91.
.23 Mahmoudian, Jaleh, Kowsari, Ali, Miqani, Qasem. Investigation of radiographic prevalence of extra mesiodens teeth in 6-9 year old children in Tehran. Journal of Dentistry. 1993; 6 (2): 1-14.
24. Asaumi J-I, Shibata Y, Yanagi Y, Hisatomi M, Matsuzaki H, Konouchi H, et al. Radiographic examination of mesiodens and their associated complications. Dentomaxillofacial Radiology. 2004;33(2):125-7.
25. Buenviaje T, Rapp R. Dental anomalies in children: a clinical and radiographic survey. ASDC journal of dentistry for children. 1984;51(1):42.
26. Järvinen S, Lehtinen L. Supernumerary and congenitally missing primary teeth in Finnish children: an epidemiologic study. Acta Odontologica Scandinavica. 1981;39(2):83-6.
27. Sulabha A, Sameer C, Umesh K, Warad N. Mesiodens: A radiographic study among the children of Bijapur, India. Journal of Advanced Oral Research. 2012;3(3):13-7.
28. Colak H, Uzgur R, Tan E, Hamidi M, Turkal M, Colak T. Investigation of prevalence and characteristics of mesiodens in a non-syndromic 11256 dental outpatients. Eur Rev Med Pharmacol Sci. 2013;17(19):2684-9.

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

29. Kazanci F, Celikoglu M, Miloglu O, Yildirim H, Ceylan I. The frequency and characteristics of mesiodens in a Turkish patient population. European journal of dentistry. 2011;5(03):361-5.
30. Lara TS, Lancia M, Silva Filho OGd, Garib DG, Ozawa TO. Prevalence of mesiodens in orthodontic patients with deciduous and mixed dentition and its association with other dental anomalies. Dental press journal of orthodontics. 2013;18(6):93-9.
31. Kaur TB, Arora RH, Arora KS. Frequency, Prevalence and Characteristics of Mesiodens in a Non–Syndromic North Indian Population. 2017 5;7(1):9.
32. Abbasi, Farida, Mo'oudi, Ehsan, Far H, Sina, et al. Radiographic examination of the frequency of mesiodens in a population of children aged 12-7 years and the resulting problems. Scientific Journal of Babol University of Medical Sciences. 2014; 16 (5): 62-6.

## Table and Figures:

**Table 1**: Mesiodens frequency (prevalence)of 12-6 year old children referred to Sari School of Dentistry during the years of 1992-98 by gender

| **sex** | **Mesiodens** | |
|---|---|---|
| | YES | NO |
| male | 5 (1.3 %) | 373 (98.7 %) |
| female | 1 (0.2 %) | 591 (99.8 %) |
| total | 6 (0.6) | 964 (99.4 %) |

**Table 2:** Relationship between sex and mesiodens of children aged 6-12 years referring to Sari School of Dentistry during 1992-98

| **P- VALUE Chi-square %** | $\chi^2$ | **Women** | **Men** | **Mesiodens** |
|---|---|---|---|---|
| 0.025 | 0.739 | Number (percentage) | Number (percentage) | |
| | | (60.9) 591 | (38.5) 373 | No |
| | | (0.1) 1 | (0.5) 5 | Yes |

**Table 3:** Frequency (prevalence)of mesiodens in the age groups of 12-6 year old children referring to Sari School of Dentistry during the years of 1992-98

[ Downloaded from mail.intjmi.com on 2026-11-19 ]
[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]

| AGE | Mesiodens | |
|---|---|---|
| | YES | NO |
| y 9-6 | (% 0.4) 2 | (% 99.6) 491 |
| y 12-10 | (% 0.8) 4 | (%992) 473 |

**Table 4**: Relationship between mesiodense and age groups of 6-12 year old children referring to Sari School of Dentistry during the years of 1992-98

| Mesiodens | Age group | | | p- value fisher test |
|---|---|---|---|---|
| | y 9-6 | y 12 -10 | | |
| | Number (p) | Number (p) | | |
| YES | (% 0.2) 2 | (% 0.4) 4 | | 0.444 |
| NO | (% 50.6) 491 | (% 48.8) 473 | | |

**Table 5**: The results of the Mann-Whitney test to compare age in two groups of with and without mesiodense 6-12 years old children, referring to Sari School of Dentistry during the years of 1992-98.

| P- Value | S.D | Average | Number | Mesiodens |
|---|---|---|---|---|
| 0.309 | 1.78 | 10 | 926 | **YES** |
| | 1.80 | 9.26 | 6 | **NO** |

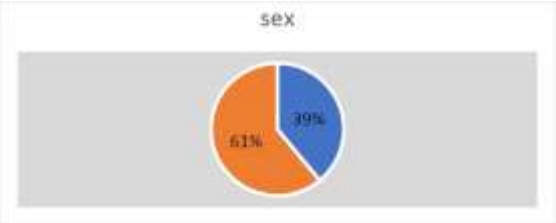



**Figure 1**: Circular diagram of the frequency percentage of sex

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]




**Figure 2**. Sample column distribution of samples in age categories



**Figure 3** :Grown mesiodense between the two maxillary central teeth

[ Downloaded from mail.intjmi.com on 2026-11-19 ]

[ DOR: 20.1001.1.23222913.2020.9.3.4.5 ]