

The Prevalence and the Characteristics of Supernumerary Teeth of Children and Young Adolescents from North-Western Region of Turkey

Levent Demiriz^{1*}, Ahmet Ferhat Mısır² and Mustafa Cenk Durmuşlar²

¹Department of Pedodontics, Bülent Ecevit University, Faculty of Dentistry, Zonguldak, Turkey.

²Department of Oral and Maxillofacial Surgery, Bülent Ecevit University, Faculty of Dentistry, Zonguldak, Turkey.

Authors' contributions

This work was carried out in collaboration between all authors. Author LD designed the study, wrote the protocol, and wrote the manuscript. Authors AFM and MCD managed the examinations and surgical treatments. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2015/16422

Editor(s):

(1) Joao Paulo Steffens, Department of Dentistry, University of Uberaba, Brazil.

Reviewers:

(1) Parveen Akhter Lone, Department Oral and Maxillofacial Surgery, Indira Gandhi Government Dental College, University of Jammu, Jammu & Kashmir, India.

(2) Shiu-Yin Cho, Fanling School Dental Clinic, 2/F Fanling Health Centre, 2, Pik Fung Road, Fanling, N.T., Hong Kong, China.
Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=945&id=12&aid=8276>

Original Research Article

Received 1st February 2015
Accepted 13th February 2015
Published 26th February 2015

ABSTRACT

Aim: The objective of the following research is to study the prevalence by evaluating a large group of children and young adolescent patients from the north-western region of Turkey and investigate the characteristics of supernumerary teeth.

Methodology: This descriptive and retrospective study was performed on 6535 non-syndromic children and adolescent patients (4077 females and 2458 males) ranging in age from 5 to 18 years old. The characteristics of supernumerary teeth were noted and diagnosed during the clinical and radiographic examination. For each patient we recorded the demographic variables including age and gender. During statistical analysis Chi-squared test was used to determine potential differences in the distribution of supernumerary teeth when stratified by gender. p value of less than .05 was considered statistically significant.

Results: 177 supernumerary teeth were detected in 141 patients (2.2%). 58 patients were females and 83 patients were males with a 1.4:1 male/female ratio (p<.001) among them. In 78.0% (n=110) of patients, one supernumerary tooth was observed. A total of 177 supernumerary teeth were

*Corresponding author: Email: drleventdemiriz@gmail.com;

observed, of which 84.2% (n=149) were located in the maxillary arch, while 15.8% (n=28) were determined in the mandible. 78 teeth (44.1%) of all supernumerary teeth were found in the maxilla midline (mesiodens). Regarding their status within the arch, 65 supernumerary teeth (36.7%) had erupted. 100(56.5%) supernumerary teeth did not cause any complications whereas 77(43.5%) teeth caused a complication. 119 supernumerary teeth (67.2%) were extracted and most of them were the complication source, however periodical observation was chosen as a treatment option for 58 teeth (32.8%).

Conclusion: The frequency of supernumerary teeth was 2.2% in the following research and we found out that supernumerary teeth are not a very rare case among children and young adolescents and clinicians should take measures and examine all patients carefully even at early ages.

Keywords: Children; hyperdontia; prevalence; supernumerary teeth; young adolescents.

1. INTRODUCTION

Supernumerary teeth are described as the teeth that exceed the normal dentition no matter what their location and form are. This condition is also called "hyperdontia". They are a rare alteration of odontogenesis defined as the presence of a number of the teeth which is greater than the normal dental formula (20 in the primary dentition and 32 in the permanent dentition) [1,2]. Although this problem seems to be caused by environmental or genetic factors, the main aetiology is not known [3,4]. These teeth have been found in both primary and permanent dentitions, however the appearance in the permanent dentition is higher than in the primary teething. Thus, the prevalence reported in the literature of hyperdontia ranges between 0,2-0,8% in the primary dentition, and in the permanent dentition, between 0,3-3,8% of the general population [2,5-8]. Supernumerary teeth are more frequent among males than among females in a proportion of 2:1 [1,2].

Supernumerary teeth may occur on one or both jaws and their number may vary such as: single, double or multiple, unilateral or bilateral [4]. Multiple hyperdontia can be associated with several syndromes, however it can be present among patients without any systemic illness. Accordingly, the presence of supernumerary teeth may result in different complications. These complications are described as unerupted teeth or delayed eruption, ectopic eruption, displacement, diastemas, occlusal problems, rotated neighboring teeth, radicular resorption and cyst formation [4,6,9]. In other cases, supernumerary teeth are asymptomatic and they cannot be diagnosed without routine radiographic examination, if they do not appear in the oral and maxillofacial region. In addition, complications on

the neighbouring teeth may help to suspect the presence of supernumerary teeth [9,10].

Supernumerary teeth may be classified depending on their location in dental arches and morphology. They can be located in any zone of the maxilla and mandible and can occur in various forms. Supernumerary teeth are mostly located in the anterior medial region (between two maxillary incisors) and these teeth are named mesiodens [2,3,11]. This is commonly followed by maxillary lateral incisor, maxillary fourth molar, mandibular third premolar, maxillary premolar, maxillary canine and mandibular fourth molar. In literature, four morphological types of supernumeraries have been described: (1) conical; (2) tuberculate; (3) supplemental; (4) odontomatous [9,12,13]. Moreover, eruption condition, anatomical neighbourhood and the development stage of supernumerary teeth and the severity of alteration or complication determines the treatment plan. Treatment options vary from surgical to orthodontic intervention. An early diagnosis allows an early intervention, a more favourable prognosis, and minimal complications [3,8].

The objective of the present research was to study the prevalence by evaluating a large group of Turkish children and young adolescent patients from north-western Anatolia and investigate the characteristics of supernumerary teeth. In addition to this, the evaluation of the associated complications and treatment protocols were made.

2. MATERIALS AND METHODS

This descriptive and retrospective study was performed on 6535 non-syndromic children and adolescent patients (4077 females and 2458

males) without any surgical extraction story, and ranging in age from 5 to 18 years old attending the Department of Pedodontics, Faculty of Dentistry, Bulent Ecevit University during the period of five years. 141 patients (58 females and 83 males), who had supernumerary teeth, were included to the following research. The reasons for their visit to the dentist's included tooth caries, malocclusion, the delay or lack of the eruption of permanent teeth and a routine dental check-up. Patients diagnosed with any syndrome and those who had any injury or previous extractions were excluded from the research work. Deciduous supernumerary teeth were also excluded from the evaluation to provide the standardization on the permanent supernumerary teeth classification. All supernumerary teeth were noted and diagnosed during a clinical and radiographic examination with the help of panoramic and periapical radiographs. Additionally, occlusal radiographs were taken when necessary. For each patient we recorded the demographic variables including age and gender.

According to the clinical and radiographic examination, all supernumerary teeth were classified under several categories such as: location (maxilla or mandible, specifying the region from anterior to posterior), orientation (vertical, angled, horizontal, and inverted), morphology (conical, tuberculate, supplemental, odontomatous), eruption (unerupted, erupted). Additionally, associated pathologies or complications and treatment protocols were analysed. During statistical analysis, Chi-squared test was used to determine potential differences in the distribution of supernumerary teeth when stratified by gender. *P* value of less than .05 was considered statistically significant.

3. RESULTS

During the research supernumerary teeth were detected among 141 patients (2.2%). 58 patients were females and 83 patients were males with a 1.4:1 male/female ratio ($p < .001$) among them (Table 1).

Table 2 shows the age of the patients. In all patients, supernumerary teeth were mostly observed at the age of seven and eight (21.3%). Among male patients supernumerary teeth were mostly observed at the age of seven and eight (21.7%). Among female patients supernumerary teeth were mostly observed at the age of fifteen and sixteen (22.4%).

Table 3 shows the characteristics of supernumerary teeth. 177 supernumerary teeth were detected among 141 patients. In 78.0% ($n=110$) of patients, one supernumerary tooth was observed. In 20.6% ($n=29$) of patients two supernumerary teeth were observed. One patient (0.7%) had three supernumerary teeth, and one more patient (0.7%) had six supernumerary teeth (Fig. 1). In total 177 supernumerary teeth were observed, among which 84.2% ($n=149$) were located in the maxillary arch, while 15.8% ($n=28$) were found in the mandible. 78 teeth (44.1%) were found in the maxilla midline (mesiodens) and 63 teeth (35.6%) were found in the maxilla anterior including central, lateral and canine tooth regions. Maxilla midline and maxilla anterior regions were followed by mandible premolar (9.0%), mandible anterior (5.6%), maxilla molar (2.8%), maxilla premolar (1.7%) and mandible molar (1.1%). Among 177 supernumerary teeth which were examined, 66.1% ($n=117$) were conical, 18.1% ($n=32$) were tuberculate, 12.4% ($n=22$) were supplementary and 3.4% ($n=6$) were odontomatous. In terms of orientation, 61% ($n=108$) of all supernumerary teeth were vertical. Regarding their status within the arch, 65 supernumerary teeth (36.7%) had erupted. 100 supernumerary teeth (56.5%) did not cause any complications. However, 59 teeth (33.3%) caused impaction and 13 teeth (7.3%) caused displacement of the adjacent teeth. Additionally, 5 teeth (2.9%) were associated with a pathology as a cystic lesion (Fig. 2). 119 supernumerary teeth (67.2%) were extracted and most of them were the complication source, whereas the periodical observation was chosen as a treatment option for 58 teeth (32.8%). Additionally, 27 patients (19.2%) were directed to Department of Orthodontics for orthodontic treatment. On the other hand, 11 patients (7.8%) were directed to Department of Maxillofacial Surgery after the orthodontic consultation. The extraction of seventeen impacted permanent teeth was necessary.

4. DISCUSSION

Supernumerary teeth are abnormal alterations described as the teeth formed in excess of the primary and permanent dental arch [12]. These teeth can be associated with a syndrome such as cleidocranial dysplasia, Gardners syndrome or cleft lip and palate whereas they can be found among non-syndromic patients [10,11,14]. The main aetiologic factor of these teeth has not been identified clearly, however various theories have been made about their presence, such as the

excessive growth of the dental lamina, heredity factors, atavism, dichotomy and general diseases [15-18]. Although primary and permanent dentitions are affected, a higher incidence of the anomaly is noted in the permanent dentition [19]. In this research non-syndromic patients with the mixed or permanent dentition were evaluated. However, deciduous supernumerary teeth were excluded from the evaluation to provide the standardization for permanent supernumerary teeth classification. In the literature, the frequency of supernumerary teeth in general population is between 0.1% and 3.8% [2,7,9,20-24]. In our research it was observed that 141 patients were affected among 6535 non-syndromic patients and the frequency was 2.2%. Our research shows that the proportion of supernumerary teeth in relation to sex was more prevalent in male population, with a ratio 1.4:1 ($p < .001$). This result was slightly inferior than the results of previous researches which reported that males are affected approximately twice as frequently as females in the permanent dentition [2,10,11,13,25]. However, this male preponderance is similar with the prevalence reports of general Caucasian population, which varies from 1.3:1 to 2.5:1 [14]. Furthermore, our results verified the common confirmations that the occurrence of supernumerary teeth is higher among males [3,13,14,26-30]. In a study of Rajab & Hamdan [13], the ratio of male/female was 2.2:1 and the difference in sex ratio was concerned to racial differences or possible sampling differences. The frequency difference between males and females was found in higher results by Liu et al. [14] with 2.64:1 (male/female) ratio in China. Moreover, in

a different study of Chinese children the male/female ratio was 6.5:1 [31]. In recent years several studies were promoted about this topic in Turkey [2,9]. In the study of Esenlik et al. [9] 84 supernumerary teeth were found in 69 of 2599 patients (the age range was from 6 to 16) and the frequency was 2.7%. In addition, the male/female ratio was 1.13:1. In a study made by Çelikoğlu [2] this ratio was 1.8:1 and 42 among 3491 patients from the age of twelve to the age of twenty five 25(1.2%). According to this research, the results showed various frequencies and sex ratios in Turkey. This situation may be explained by the differences between the age range, the number of examined patients and the limited number of the effected subjects. Thus, we tried to reach a maximum number and 6535 patients were examined although the frequency of supernumerary teeth (2.2%) in our research might not present the general Turkish population. This situation may be provided by a comprehensive study which includes every region of Turkey. Kara et al. [4] organized a retrospective study including 10 clinics in 7 Turkish cities and 104.902 patients (with the age range from 14 to 43) were carried out, however they only focused on supernumerary molar teeth.

In the literature the age of patients with supernumerary teeth ranges from 5 to 70; however, most cases are observed between the age of 7 and 10 [3,13,27,32-34]. Esenlik et al. [9] reported that in his research most cases were found between the age of seven and nine. We found most cases between 7 and 10 year-old children (38.3%) and the results of our research were similar with the previous results.

Table 1. Distribution of the supernumerary teeth according to the gender

Gender	n	Patients had Supernumerary teeth	Frequency (%)	P value	Totally (%)
Female	4077	58	1.4	p<.001	141(2.2)
Male	2458	83	3.4		

Table 2. Age of patients

Age (years)	Gender			Total	%
	Male	Female			
5-6	11	4		15	10.6
7-8	18	12		30	21.3
9-10	17	7		24	17.0
11-12	16	10		26	18.4
13-14	11	8		19	13.5
15-16	6	13		19	13.5
17-18	4	4		8	5.7
Total	83	58		141	100

Table 3. Characteristics of the supernumerary teeth

Supernumerary tooth characteristics		Number	%	
Total number		177	100	
Location	Mesiodens (MaxillaMidline)	78	44.1	
	MaxillaAnterior (Central-Lateral-Canine)	63	35.6	
	MaxillaPremolar	3	1.7	
	MaxillaMolar	5	2.8	
	MandibleAnterior (Central-Lateral-Canine)	10	5.7	
	MandiblePremolar	16	9.0	
	MandibleMolar	2	1.1	
Number	ToothNumber	PatientNumber		
	1	110	110	62.1
	2	29	58	32.8
	3	1	3	1.7
	6	1	6	3.4
Morphology	Conical	117	66.1	
	Tuberculate	32	18.1	
	Supplementary	22	12.4	
	Odontomatous	6	3.4	
Orientation	Vertical	108	61.0	
	Angled (Mesioangular-Distoangular)	31	17.5	
	Transverse	19	10.7	
	Inverted	19	10.7	
Status	Impacted	112	63.3	
	Erupted	65	36.7	
Complications	Asymptomatic	100	56.5	
	Associatedpathology	5	2.9	
	Impaction	59	33.3	
	Crowding	13	7.3	
Treatment	Extraction	119	67.2	
	Observation	58	32.8	

**Fig. 1. Multiple bilateral supernumerary teeth**

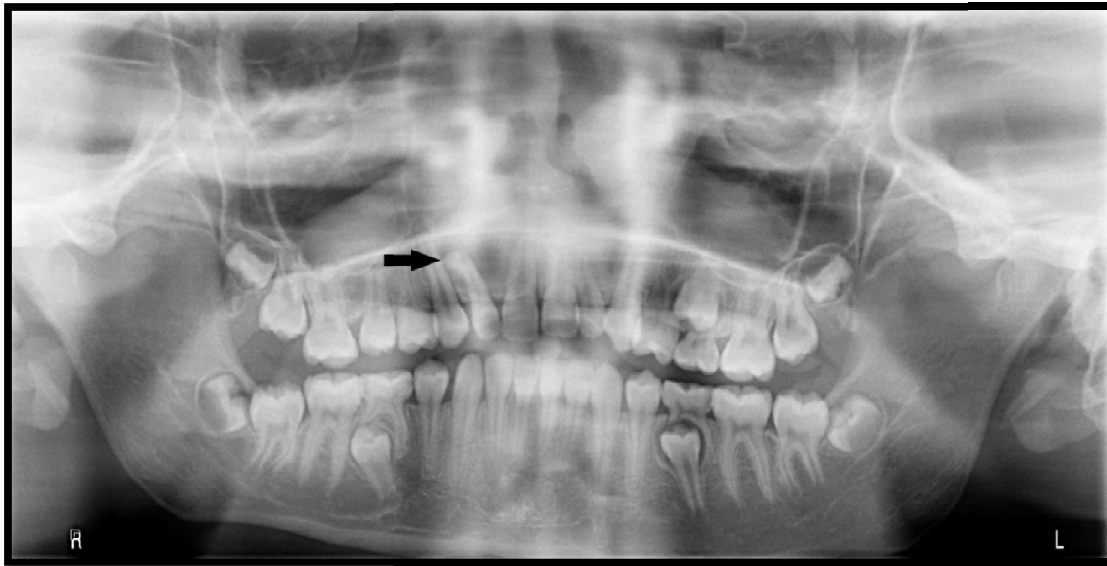


Fig. 2. A supernumerary tooth (showed with a black arrow) caused a cystic lesion in maxilla. The supernumerary tooth was located in the apical third level of the maxillary right lateral permanent tooth

Supernumerary teeth can appear in any region of the jaws, however they most commonly involve the premaxilla which has also been identified as the predominant location by many researchers [9,10,19,35]. When the results of our research were evaluated, 79.7% (n=141) of supernumerary teeth were found in premaxilla and this result is supported by considering the premaxilla as the predominant location. 44.1% (n=78) of supernumerary teeth were mesiodens. In the research of Montenegro et al. [28] the results showed that mesiodens are the most frequent type of the supernumerary teeth (46.9%). This situation may be explained by obvious complications of mesiodens, so these teeth can be diagnosed easily by the parents; this affects the number of referrals [9].

Regarding the location of observed supernumerary teeth in this research, 84.2% (n=149) of the supernumerary teeth were found to be in the maxillary arch. This result was close to the data reported by Gomes et al. [3] who found that 91.3% of the supernumerary teeth were in the maxillary arch. The reviews by Hattab et al. [36] or Zhu et al. [37] claim that 90% of supernumerary teeth are found in the maxillary bone and it supports our conclusions. Nevertheless, Kumar & Gopal [15] found the highest prevalence of supernumerary teeth in the premolar region (37.5%).

Supernumerary teeth may occur singly, or in multiples, in any region of the jaws of the same person [13]. It is well established that supernumerary teeth are more frequently single teeth, while multiple supernumerary teeth appear frequently as two teeth [2,3,13,26,27,31]. However, it is rare to find multiple supernumerary teeth with no attendant diseases or syndromes [38]. According to our results, 62.1% (n=110) of the supernumerary teeth were found to be single and 32.8% (n=58) were found as two teeth and our conclusions coincide with the ones given in the literature. Additionally, 6 supernumerary teeth were observed at the same time in one (0.7%) non-syndromic patient during this research.

Supernumerary teeth appear in various shapes, the most common was conical (66.1%). The conical shape was followed by tuberculate (18.1%), supplemental (12.4%) and odontomatous (3.4%), respectively. Rajab & Hamdan¹³ reported that the most common shape was conical (74.8%) in their research, followed by tuberculate (11.9%), supplemental (6.9%) and other configurations (6.4%). In a similar study in Turkey [2] conical morphology was the most frequent shape with 50.0% ratio. In many studies of supernumerary teeth [3,8-10,20,28] similar results were found.

While assessing eruption status, we found out that 36.7% (n=65) of the supernumerary teeth

were erupted. This result was close to other reported results about erupted supernumerary teeth [3,13,27]. All erupted supernumerary teeth were normally-orientated; none of the transverse or inverted supernumerary teeth were erupted, so we verified that erupted supernumerary teeth were commonly vertical. On the other hand, 63.3% (n=112) of supernumerary teeth were impacted and these teeth were detected during a routine radiographic examination to see the place which was shown by the complaining. This result showed the important role of the routine radiographic examinations for detecting supernumerary teeth, however radiographic examination especially with only a panoramic radiograph may not be completely adequate and clinical experience with higher level of dental training is necessary for identifying supernumerary teeth [39]. Additionally, early diagnosis and treatment of patients with supernumerary teeth prevent or minimize possible complications [13].

Clinical complications were seen in 43.5% of the supernumerary teeth. Displacement and impaction were the most frequent. Many authors have shown that the displacement of adjacent permanent teeth is a clinical complication frequently observed [3,13,25,27,32]. The ideal time for the surgical removal of an unerupted supernumerary tooth is controversial. Some authors recommended the early removal of the supernumerary tooth following the initial diagnosis, whereas other authors prefer delaying surgical intervention until the older ages [3,13,26]. Early removal is recommended to facilitate the spontaneous eruption of impacted permanent tooth when the supernumerary tooth is associated with delayed eruption or impaction of the permanent tooth [8,13].

The optimal time for the surgical intervention in premaxilla is when the patient is 10 years old when the root development of the central and lateral incisor is nearly complete [3,13,26,40-43]. Since the supernumerary tooth located in the mandibular premolar region frequently requires lingual surgical access, the surgery should be postponed until the patient gets older. Conical and supplementary supernumerary teeth are easier to be surgically removed when they erupt and complete their development, whereas inverted supernumerary teeth require the surgery which is complex, with osteotomy and flap³. During this research the surgical extraction of supernumerary teeth (67.2%) was indicated whenever clinical or radiographic complications

were observed. Nevertheless, 32.8% of supernumerary teeth were not extracted and clinical follow-up was indicated. The extraction is not always the treatment choice for supernumerary teeth [13]. Garvey et al. [25] recommended monitoring without removal when the satisfactory eruption of the adjacent teeth has occurred, no active orthodontic treatment is planned, no pathology is observed, and when the removal would may influence the functionality of the related teeth.

5. CONCLUSION

Our research focused on children and young adolescent patients ranging from the age of five to eighteen in order to emphasize the importance of early diagnosis and the appropriate treatment for preventing several complications of supernumerary teeth such as uneruption of adjacent permanent teeth and possible orthodontic problems. The frequency of supernumerary teeth was 2.2% in this research and we came to the conclusion that supernumerary teeth are not a very rare case in mixed and permanent dentition. Moreover, most of the supernumerary teeth were detected by periapical and panoramic radiographs during a routine examination. These results highlight that supernumerary teeth may not evince their presence and clinicians should take measures and examine all patients carefully even at early ages.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

ACKNOWLEDGEMENTS

The authors would like to thank Dr. Fűrüzan Köktürk for the statistical analysis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Diaz A, Orozco J, Fonseca M. Multiple hyperodontia: Report of a case with 17

- supernumerary teeth with non-syndromic association. *Med Oral Patol Oral Cir Bucal*. 2009;14:229-31.
2. Çelikoğlu M, Kamak H, Oktay H. Prevalence and characteristics of supernumerary teeth in a non-syndromic Turkish population: Associated pathologies and proposed treatment. *Med Oral Patol Oral Cir Bucal*. 2010;15:575-8.
 3. De Oliveira Gomes C, Drummond SN, Jham BC, Abdo EN, Mesquita RA. A survey of 460 supernumerary teeth in Brazilian children and adolescents. *Int J Paediatr Dent*. 2008;18:98-106.
 4. Kara MI, Aktan AM, Ay S, Bereket C, Şener İ, Bülbül M, Ezirganlı Ş, Polat HB. Characteristics of 351 supernumerary molar teeth in Turkish population. *Med Oral Patol Oral Cir Bucal*. 2012;17:e395-400.
 5. Tuna EB, Kurklu E, Gencay K, Ak G. Clinical and radiological evaluation of incisor impaction of supernumerary teeth. *Med Oral Patol Oral Cir Bucal*. 2013;18:613-8.
 6. Mali S, Karjodkar FR, Sontakke S, Sansare K. Supernumerary teeth in non-syndromic patients. *Imaging Sci Dent*. 2012;42:41-5.
 7. Mason C, Azam N, Holt RD, Rule DC. A retrospective study of unerupted maxillary incisors associated with supernumerary teeth. *Br J Oral Maxillofac Surg*. 2000;38:62-5.
 8. Sharma A, Singh VP. Supernumerary teeth in Indian children: A survey of 300 cases. *Int J Dent*. 2012;745265.
 9. Esenlik E, Sayin MÖ, Atilla AO, Özen T, Altun C, Başak F. Supernumerary teeth in a Turkish population. *Am J Orthod Dentofacial Orthop*. 2009;136:848-52.
 10. Ferrés-Padró E, Prats-Armengol J, Ferrés-Amat E. A descriptive study of 113 unerupted supernumerary teeth in 79 pediatric patients in Barcelona. *Med Oral Patol Oral Cir Bucal*. 2009;14:331-6.
 11. LecoBerrocal MI, Martin Morales JF, Martinez González JM. An observational study of the frequency of supernumerary teeth in a population of 2000 patients. *Med Oral Patol Oral Cir Bucal*. 2007;12:134-8.
 12. Türkharman H, Yılmaz HH, Çetin E. A non-syndromic case with bilateral supernumerary canines: report of a rare case. *Dentomaxillofac Radiol*. 2005;34:319-21.
 13. Rajab LD, Hamdan MA. Supernumerary teeth: Review of the literature and a survey of 152 cases. *Int J Paediatr Dent*. 2002;12:244-54.
 14. Liu DG, Zhang WL, Zhang ZY, Wu YT, Ma XC. Three-dimensional evaluations of supernumerary teeth using cone-beam computed tomography for 487 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2007;103:403-11.
 15. Kumar DK, Gopal KS. An epidemiological study on supernumerary teeth: A survey on 5000 people. *J Clin Diagn Res*. 2013;7:1504-7.
 16. Sedano HO, Gorlin RJ. Familial occurrence of mesiodens. *Oral Surg Oral Med Oral Pathol*. 1969;27:360-1.
 17. Ramesh K, Venkataraghavan K, Kunjappan S, Ramesh M. Mesiodens: A clinical and radiographic study of 82 teeth in 55 children below 14 years. *J Pharm Bioallied Sci*. 2013;5:S60-2.
 18. vonArx T. Anterior maxillary supernumerary teeth: A clinical and radiographic study. *Aust Dent J*. 1992;37:189-95.
 19. Mukhopadhyay S. Mesiodens: A clinical and radiographic study in children. *J Indian Soc Pedod Prev Dent*. 2011;29:34-8.
 20. Kuchler EC, Costa AG, Costa Mde C, Vieira AR, Granjeiro JM. Supernumerary teeth vary depending on gender. *Braz Oral Res*. 2011;25:76-9.
 21. Carvalho JC, Vinker F, Declerck D. Malocclusion, dental injuries and dental anomalies in the primary dentition of Belgian children. *Int J Paediatr Dent*. 1998;8:137-41.
 22. Brook AH. A unifying aetiological explanation for anomalies of human tooth number and size. *Arch Oral Biol*. 1984;29:373-8.
 23. Hurlen B, Humerfelt D. Characteristics of premaxillary hyperodontia. A radiographic study. *Acta Odontol Scand*. 1985;43:75-81.
 24. Thongudomporn U, Freer Tj. Prevalence of dental anomalies in orthodontic patients. *Aust Dent J*. 1998;43:395-8.
 25. Garvey MT, Barry HJ, Blake M. Supernumerary teeth—an overview of classification, diagnosis and management. *Journal of the Canadian Dental Association*. 1999;65:612-6.
 26. Nazif MM, Ruffalo RC, Zullo T. Impacted supernumerary teeth: A survey of 50 cases. *J Am Dent Assoc*. 1983;106:201-4.
 27. Zilberman Y, Malron M, Shteyer A. Assessment of 100 children in Jerusalem with supernumerary teeth in the

- premaxillary region. ASDC J Dent Child. 1992;59:44-7.
28. Fernández Montenegro P, Valmaseda Castellón E, Berini Aytés L, Gay Escoda C. Retrospective study of 145 supernumerary teeth. Med Oral Patol Oral Cir Bucal. 2006;11:339-44.
 29. Patchett CL, Crawford PJM, Cameron AC, Stephens CD. The management of supernumerary teeth in childhood-a retrospective study of practice in Bristol Dental Hospital, England, and Westmead Dental Hospital, Sydney, Australia. Int J Paediatr Dent. 2001;11:259-65.
 30. Salcido-García JF, Ledesma-Montes C, Hernández-Flores F, Pérez D, Garcés-Ortiz M. Frequency of supernumerary teeth in Mexican population. Med Oral Patol Oral Cir Bucal. 2004;9:403-9.
 31. Davis PJ. Hypodontia and hyperdontia of permanent teeth in Hong Kong school children. Community Dent Oral Epidemiol 1987;15:218-20.
 32. Tay F, Pang A, Yuen S. Unerupted maxillary anterior supernumerary teeth: Report of 204 cases. ASDC J Dent Child. 1984;51:289-94.
 33. Koch H, Schwartz O, Klausen B. Indications for surgical removal of supernumerary teeth in the premaxilla. Int J Oral Maxillofac Surg. 1986;15:273-81.
 34. Leyland L, Batra P, Wong F, Llewelyn R. A retrospective evaluation of the eruption of impacted permanent incisors after extraction of supernumerary teeth. J Clin Pediatr Dent. 2006;30:225-31.
 35. Alaejos C, Contreras MA, Buenechea R, Berini L, Gay C. Mesiodens: A retrospective study of 44 patients. Med Oral. 2000;5:81-8.
 36. Hattab EN, Yassin OM, Rawashdeh MA. Supernumerary teeth: Report of three cases and review of the literature. ASDC J Dent Child. 1994;61:382-93.
 37. Zhu J, Marcushamer M, King DL, Henry RJ. Supernumerary and congenitally absent teeth: A literature review. J Clin Pediatr Dent. 1996;20:87-95.
 38. Açikgöz A, Açikgöz G, Tunga U, Otan F. Characteristics and prevalence of non-syndrome multiple supernumerary teeth: A retrospective study. Dentomaxillofac Radiol. 2006;35:185-90.
 39. Anthonappa RP, King NM, Rabie AB, Mallineni SK. Reliability of panoramic radiographs for identifying supernumerary teeth in children. Int J Paediatr Dent. 2012;22(1):37-43.41.
 40. Ersin NK, Candan U, Alpoz AR, Akay C. Mesiodens in primary, mixed and permanent dentitions: A clinical and radiographic study. J Clin Pediatr Dent. 2004;28:295-8.
 41. Solares R, Romero MI. Supernumerary premolars: A literature review. Pediatr Dent. 2004;26:450-8.
 42. Rao PV, Chidzonga MM. Supernumerary teeth: Literature review. Cent Afr J Med. 2001;47:22-6.
 43. Primosch RE. Anterior supernumerary teeth-assessment and surgical intervention in children. Pediatr Dent. 1981;3:204-15.

© 2015 Demiriz et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history.php?iid=945&id=12&aid=8276>