

Prevalence of Supernumerary Teeth on Panoramic Radiographs in a Non-Adult Peruvian Sample

Prevalencia de Dientes Supernumerarios en Radiografías Panorámicas de una Muestra de Peruanos no Adultos

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ABSTRACT: The design of the present study was transversal and descriptive, the objective was to determine the prevalence and distribution of supernumerary teeth in panoramic radiography from Peruvians in Lima - Peru. The panoramic radiography of 1754 non-syndromic patients between 3 to 20 years of age were evaluated in order to determine the presence of supernumerary teeth and associated variables like number of supernumerary teeth, affected jaw and region, type according to shape, type according to location, eruption status and complications. The prevalence of supernumerary teeth was 4.62% (81 patients, 113 supernumerary teeth), 2.22% in females (39 patients, 53 supernumerary teeth) and 2.4% and in the males (42 patients, 60 supernumerary teeth). A singly supernumerary tooth (72.8%), in the maxilla (72.8%) and the antero-superior region (55.8%) was the most frequent presentation; the conical (39%) and supplementary shape (25.6%) along with the anterior supernumerary teeth (34.5%) and parapremolar supernumerary teeth (31.9%) were the most frequent shape an location found; the intraosseous (46.9%) and impacted (24.8%) were the most frequent eruption status found; and the malposition of nearby teeth (38.1%) was the most frequent complication. The prevalence of supernumerary teeth in Peruvians was higher than that reported in the literature and the distribution of the supernumerary teeth associated variables was similar to those reported in the literature.

KEY WORDS: tooth abnormalities, tooth, supernumerary tooth, supernumerary/radiography tooth, supernumerary/diagnosis tooth, unerupted/radiography radiography, panoramic.

INTRODUCTION

The supernumerary teeth (SNT) or hyperodontia is a developmental alteration expressed as teeth formed in excess of the normal dental formula (Ashkenazi *et al.*, 2007) that may occur singly or multiple, uni or bilaterally and in one or both jaws (Kara *et al.*, 2012), with shape and size usually consistent with the dentition in the region of the jaw in which they are localized or with little or no resemblance (Fleming *et al.*, 2010) and it may be encountered as a chance finding during routine radiographic evaluation or as the cause of an impacted teeth (Garvey *et al.*, 1999).

The SNT can be classified (Fleming *et al.*) according to their: (a) shape as rudimental or supplemental teeth; (b) chronology as pre-deciduous, similar-to-permanent teeth and post-permanent or complementary; (c) topography as mesiodens,

paramolar, distomolar and parapremolar; and (d) orientation as vertical, inverted and transverse (Parolia *et al.*, 2011). A SNT can remain impacted for many years without complications or be the cause of complications related with tooth eruption and development of the dentition (Schmucki *et al.*, 2010) that includes: comprised space closure (Orhan *et al.*, 2006); closure of the eruption path leading to delayed or non-eruption (Khandelwal *et al.*, 2011); crowding (Kara *et al.*); diastema (Mali *et al.*, 2012); resorption or malformation of adjacent roots due pressure with lose of vitality of adjacent teeth (Parolia *et al.*); cystic formation (Acikgöz *et al.*, 2006); and interference with orthodontic mechanics (Orhan *et al.*) or alveolar bone grafting or implant placement (Parolia *et al.*). The objective of the present study was to determine the prevalence of supernumerary teeth in the panoramic

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radiography of Peruvian patients between 3 to 20 years of age, determine if there are significant differences between genres and compare our findings with similar studies in the scientific literature.

MATERIAL AND METHOD

The present study is descriptive and transversal, and was performed utilizing the digitalized images of panoramic radiographs of 1754 non-syndromic patients between 3 to 20 years who attended a private radiological center from January 2011 to December 2012. The exclusion criteria were: (a) patient age older than 20 years, (b) poor quality image, (c) cleft palate, (d) any syndrome, and (e) odontogenic tumors (including odontoma).

When a SNT was found, the information about the number (one, two or multiple), the afflicted jaw (maxilla, mandible or both), the region (anterior or posterior), the shape type (conical, supplementary or tuberculated), the topography type (anterior, mesiodens, parapremolar, paramolar or distomolar), the eruption status (intraosseous, impacted or extraosseous-erupted), the dental development status (crypt, incomplete crown, complete crown-incomplete root), the inclination-position (vertical-inclined, horizontal, transversal, inverted), and the alterations on nearby teeth (blockage of eruption, impaction, malposition of nearby teeth and no effect) were recorded. The term undetermined was used when we could not determine any of the SNT characteristic described before.

Database was grouped in Microsoft Office Excel and the statistical analysis of the data was performed by the use of the SPSS 21.0 statistical package (SPSS Inc., Chicago, IL). The determination of the significant differences between genres was determined by the chi-squared test with a confidence level of 95%.

In order to assess the strength of agreement, 271 radiographic images were randomly selected and reevaluated to determine the Kappa statistic value which was 0.87 that means an excellent strength of agreement.

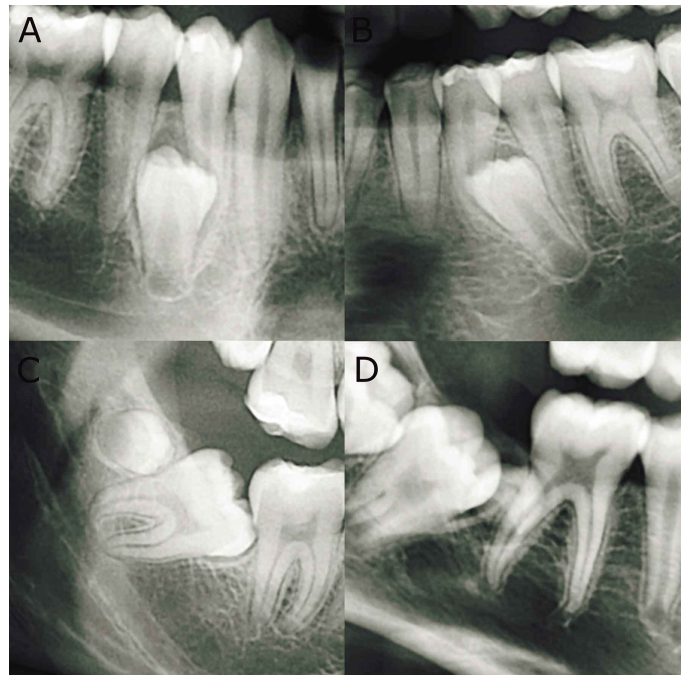


Fig. 2. Images of posterior SNT: (A,B) Supplementary paramolar in intraosseous evolution. (C) Distomolar in intraosseous evolution. (D) Paramolar in intraosseous evolution with blockage of the eruption of 47.

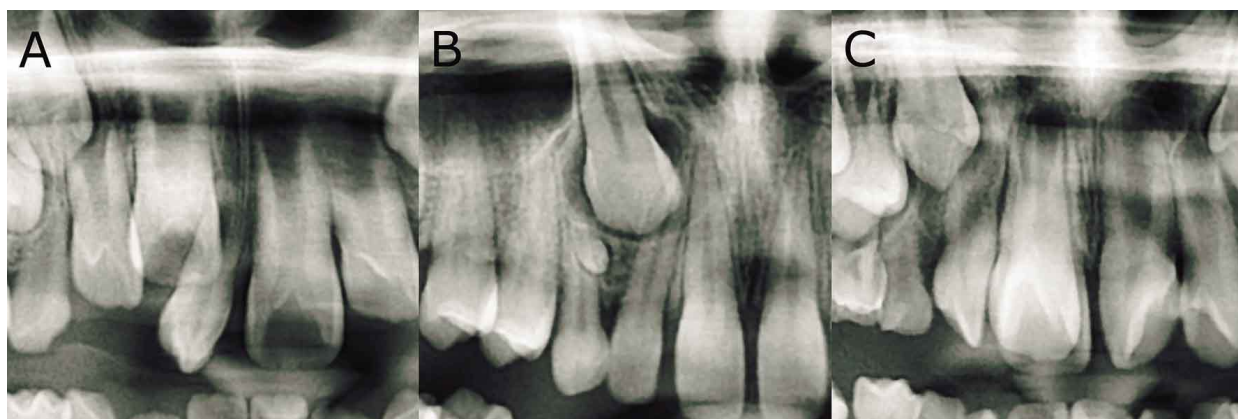


Fig. 1. Images of anterior SNT: (A) Erupted mesiodens with blockage of the eruption of 11. (B) Impacted microtooth with blockage of the eruption of 13. (C) Erupted supplemental tooth superimposed to 11.

RESULTS

Of the 1754 patients, 977 (55.7%) were female and 777 (44.3%) were male; the mean age was 12.15 ± 3.55 years. The prevalence of SNT was 4.62% (81 patients, 113 SNT), 2.22% in female (39 patients, 53 SNT) and 2.4% in male (42 patients, 60 SNT), the male to female ratio was 1.1:1. There were no significant differences in the frequency of the SNT between genres according to the chi-squared test ($p > 0.05$).

The SNT were most frequent in the maxilla in both genres (72.8%), with a singly presentation (72.8%) and in the antero-superior region (55.8%). The conical shape was the most frequent (39%, 45.5% of them were mesiodens), followed by the supplementary shape (25.6%, 65.6% of them were parapremolars and the rest were anterior teeth) and then by the tuberculated shape (8% mostly SN-molars); the undetermined shape was 27.5% because the dental development were in the early stages and the final SNT shape could not be determined. The distributions of the distinct variables of the SNT in both sexes are described in Table I.

Table I. Prevalence, distribution and related variables of the supernumerary teeth in Peruvians.

		Female†	Male‡	All cases §
Patients		39	42	81
Prevalence according to gender§		2.22	2.4	4.62
Amount of supernumerary teeth		53 (47%)	60 (53%)	113
Maxillae*	Maxilla	64.2	80.9	72.8
	Mandible	30.7	16.7	23.5
	Both jaws	5.1	2.4	3.7
Number*	One SNT	71.8	73.8	72.8
	Two SNT	23.1	19	21.0
	Multiple (three o more)	5.1	7.2	6.2
Region*	Antero-Superior	50.9	60	55.8
	Postero-Inferior	32.1	28.3	30
	Postero-Superior	11.3	11.7	11.5
	Antero-Inferior	5.7	0	2.7
SNT Classification according to shape*	Conical	34.0	43.3	39.0
	Undetermined	37.7	18.3	27.5
	Supplementary	20.8	30	25.6
	Tuberculated	7.5	8.3	8
SNT Classification according to topography*	Anterior	45.3	25.0	34.5
	Parapremolar	32.1	31.7	31.9
	Mesiodens	11.3	35	23.9
	Paramolar	7.5	8.3	8
	Distomolar	3.8	0	1.8
Eruption status*	Intraosseous	58.5	36.7	46.9
	Impacted	18.9	30	24.8
	Extraosseous-Erupted	15.1	26.7	21.2
	Undetermined	7.5	6.7	7.1
Inclination - Position*	Vertical-Inclined	45.3	51.7	48.7
	Undetermined	26.4	23.3	24.8
	Inverted	13.2	23.3	18.6
	Horizontal	7.5	1.7	4.4
	Transversal	7.5	0	3.6
Alteration on nearby teeth*	Malposition	32.1	43.3	38.1
	No effect	30.2	26.7	28.3
	Blockage of eruption	28.3	20	23.9
	Impaction	9.4	10	9.7

*The frequencies are expressed in percentages (%) and calculated according to the total number of SNT.

†Prevalence and frequencies calculated for the female population only.

‡Prevalence and frequencies calculated for the male population only.

§Prevalence and frequencies calculated for the entire sample.

DISCUSSION

The reported prevalence of the SNT in distinct countries varies between 0.3–0.85% for Arabia (Osuji & Hardie, 2002; Afify & Zawawi, 2012); 1.4–3.7% for Brazil (Küchler *et al.*, 2011; De Oliveira Gomes *et al.*, 2008); 2.7–3.4% for China and Japan (Kumar *et al.*, 2012); 0.72–0.74% for Iran (Amini *et al.*, 2013; Vahid-Dastjerdi *et al.*, 2010); 0.85% for Lithuania (Trakiene *et al.*, 2013); 3.2% for Mexico (Salcido-García *et al.*, 2004); 2.8% for Portugal (Coelho *et al.*, 2011); 0.4–3.2% for Spain (Leco Berrocal *et al.*, 2007; Ferrés-Padró *et al.*, 2009; Fernández Montenegro *et al.*, 2006); 1.5% for Sweden (Schmucki *et al.*); and 0.4–1.9% for Turkey (Kapdan *et al.*, 2012). The studied sample was Peruvian and the prevalence of SNT was higher than those in other countries including México.

The distribution of SNT appears to be different regarding sex with males affected approximately twice than females in the permanent SNT (*Parolia et al.*). The male-to-female ratio reported in the literature were 1.45:1 to 2.1:1 in Brazilian (Küchler *et al.*; De Oliveira Gomes *et al.*); 3:1 to 6.5:1 in Chinese (Esenlik *et al.*, 2009; Anthonappa *et al.*, 2008); 2.9:1 in Indian (Sharma & Singh, 2012; Mukhopadhyay, 2011; Khandelwal *et al.*); 5:1 in Iranian (Meighani & Pakdaman, 2010); 2.8:1 in Japanese (Asaumi *et al.*, 2004); 2.2:1 in Jordanian (Esenlik *et al.*); 1.18:1 in Mexican (Salcido-García *et al.*); 1.4:1 to 2.3:1 in Spanish (Leco Berrocal *et al.*; Ferrés-Padró *et al.*); and 1.13:1 to 1.4:1 in the Turks (Esenlik *et al.*; Öztas *et al.*, 2011). The male-to-female ratio found in the present study (1.1:1) is lower than those reported for most countries with an exception for Turks (Esenlik *et al.*; Öztas *et al.*) and Mexicans (Salcido-García *et al.*), this suggests that the prevalence of SNT could not be related to sex in the studied sample.

The SNT are singly in 76-86% of the cases, while double SNT occurs in 12-23% and multiple SNT occurs in less than 1% of the cases (Khandelwal *et al.*; Kumar *et al.*). Cases involving one or two SNT most commonly affect the anterior maxilla, followed by the premolar region; and cases involving multiple (more than five) SNT tend to involve the mandibular premolar region (Shah *et al.*, 2008). The distribution of single-double-multiple SNT per case in distinct countries is 64.1%–25.6%–0.095% for American Blacks and Whites (Harris & Clark, 2008); 92.5%–30.8%–6.2% for Brazilian (Küchler *et al.*; De Oliveira Gomes *et al.*); 61.5%–29.8% for Chinese (Anthonappa *et al.*); 79%–20%–1% for

Indian (Sharma & Singh); 100%–14.3% for Iranian (Amini *et al.*; Vahid-Dastjerdi *et al.*); 90%–7.5%–2.5% for Portuguese (Coelho), 77.5%–27.85%–2.8% in Spanish (Ferrés-Padró *et al.*; Fernández Montenegro *et al.*); 78.2%–24%–24.3% in Turks (Esenlik *et al.*; Öztas *et al.*; Peker *et al.*, 2009). The distribution of single-double-multiple SNT found in the present study was 72.8%–21%–6.2%, which is similar to the results found in the literature with an exception for Turks.

The shape classification of the SNT is one of the most important variables in their investigation, Küchler *et al.* and De Oliveira Gomes *et al.* (Brazil) reported a frequency of 55.5%–54.3% of conical SNT, 25.9%–38.6% of tuberculated SNT and 18.5%–16.7% of supplemental SNT respectively. Anthonappa *et al.* (China) reported 71.5% of conical SNT, 11.6% of supplemental SNT and 10.9% of tuberculated SNT. Sharma & Singh (India) reported 59.7% of conical SNT, 18.2% of supplemental SNT, 14.3% tuberculated SNT and 7.8% molariform SNT. Vahid-Dastjerdi *et al.* (Iran) reported 42.8% of conical SNT, 21.4% of supplemental SNT and 14.2% of tuberculated SNT. Fernández-Montenegro *et al.* and Ferrés-Padró *et al.* (Spain) reported 56.5%–69.62% of conical SNT, 19.3%–17.72% of supplemental SNT and 11.39% of tuberculated SNT. Esenlik *et al.* and Öztas *et al.* (Turkey) reported 50%–29.3% of conical SNT, 47.6%–42.2% of supplemental SNT, 2.3%–28.4% of tuberculated SNT respectively. Our results confirms the conical-supplemental-tuberculated order when compared to similar studies, the difference in the frequency of tuberculated SNT may be due to differences in the age range and the higher frequency of undetermined shape because the incomplete crown formation.

The topographical-classification of SNT has been extensively reported; Harris (USA) reported 43.75% of distomolars, 32.8% of premolars, 15.6% mesiodens and 7.8% of anterior teeth. Osuji & Hardie (Arabia) reported 55% of mesiodens, 45% of anterior teeth. Küchler *et al.* and De Oliveira Gomes *et al.* (Brazil) reported 33.33%–28.4% of mesiodens and 14.8% of premolars respectively. Anthonappa (China) reported 81.4% of mesiodens and 14.4% of anterior teeth. Amini *et al.* (Iran) reported 58.3% of mesiodens, 25% of anterior teeth and 16.7% of paramolars. Trakiene *et al.* (Lithuan) reported 0.73% of mesiodens. Coelho *et al.* (Portugal) reported 60% of mesiodens, 26.7% of anterior teeth and 13.3% of premolars. Leco-Berrocal *et al.*, Fernández-Montenegro *et al.* and Ferrés-Padró *et al.* (Spain)

reported 42.8%–18% and 6.33% for distomolar, 28.6%–46.9% and 53.16% for mesiodens, 4.8%–25.32% for anterior teeth, 24.4%–24.1% and 12.67% for premolars, 5.6%–2.5% for paramolars and 18.99% for anterior teeth. Esenlik *et al.*, Peker *et al.* and Öztas *et al.* (Turkey) reported 51.2%–19.2% and 19.8% for mesiodens, 28.6%–8.2% and 3.5% for anterior teeth, 20.3%–35.7 and 43.1% for premolars, 26.5%–31% for distomolars, and 5.5%–2.6% for paramolars. Salcido-García *et al.* (Mexico) reported 40.5% for mesiodens, 36.3% for premolars, 1.7% for anterior teeth, 4.9% for distomolar and 4.8% for paramolar. Our results demonstrate that anterior SNT were the most frequently found (34.51%), followed by premolars (31.85%), mesiodens (23.92%) and paramolar–distomolar teeth (9.72%); such differences with respect to previous studies may represent a characteristic distribution of SNT in the studied sample of Hispano-American Peruvians.

The SNT with normal orientation will usually erupt; however, only 13–34% of all SNT are erupted (Shah *et al.*). Sharma & Singh (India) found 65% of unerupted (intraosseous or impacted) and 35% partially or fully erupted; Leco-Berrocal *et al.* (Spain) found 95.8% impacted and 4.2% erupted; Esenlik *et al.* (Turkey) found that 73.8% impacted and 26.2% erupted; Peker *et al.* (Turkey) found 69.9% impacted; and Salcido-García *et al.* (Mexico) found 97.2% impacted and 2.8% erupted. Our results (46.9% unerupted-intraosseous, 24.77% unerupted-impacted, 21.23% erupted-extraosseous) are similar to those reported by Sharma. Our results show a low frequency of impacted SNT and we must note that the age range of the studies of Leco-Berrocal *et al.* and Peker *et al.* were broader than ours (7–34 and 13–70 respectively, against 3–20) and that would suggest a possible positive association between the increase in age and the percentage of impacted teeth caused by the presence of SNT. The frequency of unerupted-intraosseous SNT found in the present study may be a temporary stage, which will change into an unerupted-impacted or erupted status if untreated.

The dental displacement and the failure in the eruption represent the most frequently complications reported in the literature (Leco-Berrocal *et al.*), the delayed eruption of the associated teeth has been reported to occur in 28–60% in Caucasians (Shah *et al.*). The complications caused by SNT have been reported in different studies, De Oliveira Gomes *et al.* (Brazil) found that 55.7% of the SNT caused permanent teeth displacement and 50.8% caused the failure of

eruption. Anthonappa *et al.* (China) found that 53.8% of the SNT cause crowding and 6.8% cause an abnormal diastema. Leco-Berrocal *et al.* (Spain) found that 39% of the SNT cause the displacement of the adjacent teeth, the 12.5% cause radicular reabsorption and the 4.1% of the SNT cause the prevention of eruption. Our results are similar to those found in the literature, the malposition of nearby teeth (dental displacement) and the blockage-of-eruption/impaction represents the 38.05% and the 33.64% of all SNT respectively.

The overall patterns of presentation and incidence of SNT support the various theories proposed to explain how the condition arises and, from a developmental and molecular viewpoint, each one is plausible and can explain the origin of different types of SNT (D'Souza & Klein, 2007). The hyperactivity theory is the most accepted and hypothesizes that the dental lamina does not follow the programmed cell degeneration-death following the completion of the permanent tooth crown and continues his proliferation to form accessory tooth organs (Kara *et al.*; D'Souza & Klein; Wang & Fan, 2011; De Oliveira Gomes *et al.*). The germ dichotomy theory proposes that during early tooth development, the dental lamina splits into two parts of equal or different size, thus giving rise to two teeth with similar size, or one normal tooth and one dysmorphic tooth (Kara *et al.*; Wang & Fan). The atavism of phylogenetic theory (evolutionary throwback) suggests that the occurrence of SNT is a regression to the extinct ancestral tissues or anthropoids when our ancestor mammals have more teeth in each quadrant (Wang & Fan). The germ dichotomy and the atavism theories are actually discounted (Shah *et al.*).

At present, the most current knowledge is based upon mouse embryogenesis although the mice are not a perfect model because they only develop a single, highly-reduced (lacks of both premolars and canines) and primary dentition during their lifetime; however, the tight regulation of tooth initiation that occurs in these regions of the mouse jaw has provided useful insight into how tooth number is controlled at the molecular level (Fleming *et al.*). Moreover, the recent advances in cellular and molecular biology have led to the development of a variety of gene-targeting strategies and the analysis of the resultant mutant models have clarified specific functions of genes and their encoded proteins in embryogenesis and organogenesis, including tooth development (Nakamura & Fukumoto, 2013).

In conclusion, the prevalence of SNT in a sample of Hispano-American Peruvian was 4.62% and the most common presentation of a SNT were singly (72.8%), in the maxilla and the antero-superior region (72.8%–55.7%), with conical shape

(38.9%) and anterior-type (34.5%), intraosseous or impacted (71.7%), vertical or inclined (48.7%) and causing the malposition of nearby teeth (38.1%) and there were no significant differences between genres in the frequency of the SNT.

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RESUMEN: El presente estudio es de tipo transversal y descriptivo. El objetivo fue determinar la prevalencia y distribución de dientes supernumerarios en radiografías panorámicas de pacientes peruanos. Se evaluaron las radiografías panorámicas de 1754 pacientes entre los 3 a 20 años de edad para determinar la prevalencia de dientes supernumerarios así como las variables de cantidad, maxilar afectado, región afectada, forma, ubicación, estatus de erupción y complicaciones. La prevalencia de dientes supernumerarios fue de 4,62% (81 pacientes, 113 dientes supernumerarios), 2,22% en mujeres (39 pacientes, 53 dientes supernumerarios) y 2,4% en hombres (42 pacientes, 60 dientes supernumerarios). Los dientes supernumerarios singulares (72,8%), ubicadas en el maxilar (72,8%) y en zona anterosuperior (55,8%) fue la presentación más frecuentemente encontrada; la forma cónica (39%) y suplementaria (25,6%) junto a los dientes supernumerarios anteriores (34,5%) y para premolares (31,9%); evolución intraósea (46,9%) e impactadas (24,8%); y la alteración de dientes adyacentes (38,1%) fueron las formas, locaciones, estatus de erupción y alteraciones más frecuentemente encontradas. La prevalencia de dientes supernumerarias en peruanos fue mayor que la reportada en la literatura; la distribución de las variables relacionadas a los dientes supernumerarios fue similar a lo reportado en la literatura.

PALABRAS CLAVE: anomalías dentarias, diente supernumerario, diente supernumerario/radiografía diente supernumerario/diagnóstico, diente no erupcionado/radiografía, radiografía panorámica.

REFERENCES

- Acikgöz, A.; Acikgöz, G.; Tunga, U. & Otan, F. Characteristics and prevalence of non-syndrome multiple supernumerary teeth: a retrospective study. *Dentomaxillofac. Radiol.*, 35(3):185-90, 2006.
- Afify, A. & Zawawi, K. H. The prevalence of dental anomalies in the Western region of Saudi Arabia. *I. S. R. N. Dent.*, 2012:837270, 2012.
- Amini, F.; Rakhshan, V. & Jamalzadeh, S. Prevalence and pattern of accessory teeth (hyperdontia) in permanent dentition of Iranian orthodontic patients. *Iranian J. Publ. Health*, 42(11):1259-65, 2013.
- Anthonappa, R. P.; Omer, R. S. & King, N. M. Characteristics of 283 supernumerary teeth in southern Chinese children. *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.*, 105(6):e48-54, 2008.
- Asaumi, J. I.; Shibata, Y.; Yanagi, Y.; Hisatomi, M.; Matsuzaki, H.; Konouchi, H. & Kishi, K. Radiographic examination of mesiodens and their associated complications. *Dentomaxillofac. Radiol.*, 33(2):125-7, 2004.
- Ashkenazi, M.; Greenberg, B. P.; Chodik, G. & Rakocz, M. Postoperative prognosis of unerupted teeth after removal of supernumerary teeth or odontomas. *Am. J. Orthod. Dentofacial Orthop.*, 131(5):614-9, 2007.
- Coelho, A.; Macho, V.; Andrade, D.; Macedo, P. & Areias, C. Prevalência e distribuição de dentes supranumerários numa população pediátrica – Um estudo radiográfico. *Rev. Port. Estomatol. Med. Dent. Cir. Maxilofac.*, 52(4):189-92, 2011.
- D'Souza, R. N. & Klein, O. D. Unraveling the molecular mechanisms that lead to supernumerary teeth in mice and men: current concepts and novel approaches. *Cells Tissues Organs*, 186(1):60-9, 2007.
- De Oliveira Gomes, C.; Drummond, S. N.; Jham, B. C.; Abdo, E. N. & Mesquita, R. A. A survey of 460 supernumerary teeth in Brazilian children and adolescents. *Int. J. Paediatr. Dent.*, 18(2):98-106, 2008.
- Esenlik, E.; Sayin, M. O.; Atilla, A. O.; Ozen, T.; Altun, C. & Basak, F. Supernumerary teeth in a Turkish population. *Am. J. Orthod. Dentofacial Orthop.*, 136(6):848-52, 2009.
- Fernández Montenegro, P.; Valmaseda Castellón, E.; Berini Aytés, L. & Gay Escoda, C. Retrospective study of 145 supernumerary teeth. *Med. Oral Patol. Oral Cir. Bucal*, 11(4):E339-44, 2006.
- 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*, 14(3):E146-52, 2009.

- Fleming, P. S.; Xavier, G. M.; DiBiase, A. T. & Cobourne, M. T. Revisiting the supernumerary: the epidemiological and molecular basis of extra teeth. *Br. Dent. J.*, 208(1):25-30, 2010.
- Garvey, M. T.; Barry, H. J. & Blake, M. Supernumerary teeth—an overview of classification, diagnosis and management. *J. Can. Dent. Assoc.*, 65(11):612-6, 1999.
- Harris, E. F. & Clark, L. L. An epidemiological study of hyperdontia in American blacks and whites. *Angle Orthod.*, 78(3):460-5, 2008.
- Kapdan, A.; Kustarci, A.; Buldur, B.; Arslan, D. & Kapdan, A. Dental anomalies in the primary dentition of Turkish children. *Eur. J. Dent.*, 6(2):178-83, 2012.
- Kara, M. I.; Aktan, A. M.; Ay, S.; Bereket, C.; Sener, I.; Bülbül, M.; Ezirganlı, S. & Polat, H. B. Characteristics of 351 supernumerary molar teeth in Turkish population. *Med. Oral Patol. Oral Cir. Bucal.*, 17(3):e395-400, 2012.
- Khandelwal, V.; Nayak, A. U.; Naveen, R. B.; Ninawe, N.; Nayak, P. A. & Sai, Prasad, S. V. Prevalence of mesiodens among six- to seventeen-year-old school going children of Indore. *J. Indian Soc. Pedod. Prev. Dent.*, 29(4):288-93, 2011.
- Küchler, E. C.; Costa, A. G.; Costa, Mde C.; Vieira, A. R. & Granjeiro, J. M. Supernumerary teeth vary depending on gender. *Braz. Oral Res.*, 25(1):76-9, 2011.
- Kumar, A.; Namdev, R.; Bakshi, L. & Dutta, S. Supernumerary teeth: Report of four unusual cases. *Contemp. Clin. Dent.*, 3(Suppl. 1):S71-7, 2012.
- Leco Berrocal, M. I.; Martín Morales, J. F. & Martínez González, J. M. An observational study of the frequency of supernumerary teeth in a population of 2000 patients. *Med. Oral Patol. Oral Cir. Bucal.*, 12(2):E134-8, 2007.
- Mali, S.; Karjodkar, F. R.; Sontakke, S. & Sansare, K. Supernumerary teeth in non-syndromic patients. *Imaging Sci. Dent.*, 42(1):41-5, 2012.
- Meighani, G. & Pakdaman, A. Diagnosis and management of supernumerary (mesiodens): a review of the literature. *J. Dent. (Tehran)*, 7(1):41-9, 2010.
- Mukhopadhyay, S. Mesiodens: a clinical and radiographic study in children. *J. Indian Soc. Pedod. Prev. Dent.*, 29(1):34-8, 2011.
- Nakamura, T. & Fukumoto, S. Genetics of supernumerary tooth formation. *J. Oral. Biosci.*, 55(4):180-3, 2013.
- Orhan, A. I.; Ozer, L. & Orhan, K. Familial occurrence of nonsyndromal multiple supernumerary teeth. A rare condition. *Angle Orthod.*, 76(5):891-7, 2006.
- Osuji, O. O. & Hardie, J. Dental anomalies in a population of Saudi Arabian children in Tabuk. *Saudi Dent. J.*, 14(1):11-14, 2002.
- Öztas, B.; Bardak, C.; Kursun, E. S. & Akbulut, N. Clinical characteristics of non-syndromic supernumerary teeth in a cohort of Turkish patients. *Oral Radiol.*, 27(2):108-113, 2011.
- Parolia, A.; Kundabala, M.; Dahal, M.; Mohan, M. & Thomas, M. S. Management of supernumerary teeth. *J. Conserv. Dent.*, 14(3):221-4, 2011.
- Peker, I.; Kaya, E. & Darendeliler-Yaman, S. Clinic and radiographical evaluation of non-syndromic hypodontia and hyperdontia in permanent dentition. *Med. Oral Patol. Oral Cir. Bucal.*, 14(8):e393-7, 2009.
- Salcido-García, J. F.; Ledesma-Montes, C.; Hernández-Flores, F.; Pérez, D. & Garcés-Ortíz, M. Frequency of supernumerary teeth in Mexican population. *Med. Oral Patol. Oral Cir. Bucal.*, 9(5):407-9, 2004.
- Schmucki, R.; Lipowski, C. & Peltomäki, T. Prevalence and morphology of supernumerary teeth in the population of a Swiss community. Short communication. *Schweiz. Monatsschr. Zahnmed.*, 120(11):987-93, 2010.
- Shah, A.; Gill, D. S.; Tredwin, C. & Naini, F. B. Diagnosis and management of supernumerary teeth. *Dent. Update*, 35(8):510-2, 2008.
- Sharma, A. & Singh, V. P. Supernumerary teeth in Indian children: a survey of 300 cases. *Int. J. Dent.*, 2012:745265, 2012.
- Trakiniene, G.; Rylis kyte, M. & Kiaus aite, A. Prevalence of teeth number anomalies in orthodontic patients. *Stomatologija*, 15(2):47-53, 2013.
- Vahid-Dastjerdi, E.; Borzabadi-Farahani, A.; Mahdian, M. & Amini, N. Supernumerary teeth amongst Iranian orthodontic patients. A retrospective radiographic and clinical survey. *Acta Odontol. Scand.*, 69(2):125-8, 2011.
- Wang, X. P. & Fan, J. Molecular genetics of supernumerary tooth formation. *Genesis*, 49(4):261-77, 2011.

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