



*Original Research Article*

**Prevalence of Teeth Number Anomalies in Permanent Dentition in a Sample From Erbil City (an Orthopantomographic Study)**

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**Abstract**

Supernumerary teeth are those teeth developed along with normal complement as a result of excess dental lamina in the jaws. Developmentally missing teeth include hypodontia, oligodontia and anodontia. Congenital missing of one or more teeth or a supernumerary tooth requires an urgent treatment as suggested by the Index of Orthodontic Treatment Need. This study tries to evaluate the prevalence and distribution of tooth number anomalies in Erbil patients in relation to the side, jaw, tooth types, and gender. Three thousand orthopantomograms of patients (9-36) years' old who is seeking dental treatments are used to determine the spreading and distribution of the hypodontia, oligodontia, and hyperdontia. Their radiographs are retrieved from Orthodontics and Radiographic Clinics at the College of Dentistry, Hawler Medical University, Erbil/Kurdistan Region of Iraq and private dental radiographic clinic in period from 2013 till 2015. A tooth is diagnosed as congenitally missing in case of no identification or discerned radiographically on the basis of calcification or there is no removal evidence. The chi-square test is to determine the importance of the upper and lower numerical teeth abnormality differences and the differences between genders. Five percent was set as the level of significance.

Hypodontia was prevalent by 7.76%, it was more often found in females in right side of maxilla. The most missed tooth was maxillary lateral incisor. The permanent congenital missing teeth were frequently in the maxilla. Mesiodens was the most common supernumerary tooth, and its prevalence was 1.13%.

**Key Words:** Hypodontia, Supernumerary, Prevalence, Orthopantomograph.

**الخلاصة**

الاسنان الزائدة هي الاسنان التي تنمو بالاضافة الى الاسنان الطبيعية كنتيجة لزيادة انتاج الصفيحة السنية للفك . ان نقص الاسنان الولادي يشمل نقص الاسنان ، قلة الاسنان و انعدام الاسنان . ان فقدان الولادي لسن واحدة او اكثر يؤدي الى ازدياد الحاجة الى العلاج حسب ما تقتضيه مقاييس العلاج التقويمي للأسنان. ان الغاية من هذا البحث هو لقياس معدل انتشار و توزيع التشوهات العديدة للأسنان في الفكين الاعلى و الاسفل والجهتين اليمنى واليسرى في كلا الجنسين في مرضى مدينة اربيل .

تم التقاط ٣٠٠٠ أشعة تصويرية تقويمية مقطعية بانورامية (OPG) لمرضى اعمارهم تتراوح بين (٩-٣٦) سنة اثناء مرحلة علاج أسنانهم وتم استعمال هذه الصور الشعاعية ( OPG ) لتعيين معدل انتشار و توزيع نقص الاسنان و قلة الاسنان و زيادة عدد الاسنان .

لقد تم استرجاع هذه الصور الشعاعية من العيادات الاستشارية لاشعة الاسنان والفكين و العيادات الاستشارية لتقويم الاسنان في كلية طب الاسنان في جامعة هولير الطبية في مدينة اربيل ، وكذلك تم تجميعها من عيادات اشعة الاسنان الخاصة في مدينة اربيل في الفترة من ٢٠١٣-٢٠١٥ .

تم اعتبار الاسنان مفقودة ولاديا في حالة عدم تمييز او التعرف شعاعيا على وجود تلكس في الفكين مع استبعاد حالات قلع الاسنان .

تم تطبيق اختبار كاي تربيع ( Chi-square ) لتمييز اهمية الفروق في الاختلافات العددية للفكين الاعلى والاسفل و كذلك لتمييز الاختلافات بين الجنسين، وقد تم اعتبار مستوى الاهمية من ٥%. لقد كان معدل انتشار نقص الاسنان ٧,٧٦% ، ان نقص الاسنان كثير الحدوث في الاناث، في الفك العلوي وفي الجهة اليمنى . لقد كان القاطع الوحشي للفك العلوي اكثر الاسنان فقدا . ان فقدان الاسنان الدائمة كان اكثر حدوثا في الفك العلوي . ان معدل حدوث الاسنان الاضافية كانت بنسبة ١,١٣% ، وأكثر الاسنان الاضافية كانت الرأوول الاتسي .

## Introduction

**D**ental anomalies include any abnormality in the size, form, position and number of teeth numbers [1]. Supernumerary teeth are teeth formed extra to normal complement as a result of excess dental lamina in the jaws [2]. Developmentally missing teeth include hypodontia when one of the six teeth is absent, oligodontia when more than six teeth are absent, and anodontia when all teeth are absent [3]. Congenital missing or supernumerary teeth result in greater need of treatment as suggested by the Index of Orthodontic Treatment Need [4].

Therefore, hypodontia prevalence and hyperdontia informations are very important for early diagnosis and proper treatment planning [5,6]. It is important to prevent hypodontia complications like malocclusion ,diseases of periodontia, and negative effects on growing alveolar [7-9]. Prevalence regularity differences expected regarding to the variety in samples concerning measuring techniques, radiography different methods and clinical examinations, age, gender, geographic or demographic profiles [8,10, 11,12].

Clinically, supernumerary teeth may bring different local disorders, such as primary tooth retention, delayed eruption of the permanent tooth, ectopic eruptions, tooth displacements, follicular cysts, and other alterations, requiring surgical or orthodontic intervention [13,14]. Supernumerary teeth are known by the region where they locate. Mesiodens is usually placed between both central upper incisors [15].

This paper is study the evaluation of the prevalence and distribution of tooth number anomalies in Erbil patients in relation to the side, jaw, tooth types, and gender.

## Materials and Methods

In this study, three thousand orthopantomograms of patients who are seeking dental treatment are used to determine the diffusion and distribution of the hypodontia, oligodontia, and hyperdontia. Their radiographs are retrieved from Orthodontics and Radiographic Clinics at the College of Dentistry, Hawler Medical University, Erbil/Kurdistan Region of Iraq and private dental radiographic clinic in period from 2013 till 2015. Patients between the ages of 9 to 36 when the OPGs were taken without history of removed teeth are included in the study. Patients who have any sort of systemic anomaly, particularly cleft lip/palate and Down's syndrome were excluded from the study because of delayed tooth development in such conditions [8].

A tooth is diagnosed as congenitally missing in case of no identification or discerned radio graphically on the basis of calcification or there is no removal evidence. If the hypodontia diagnosis is not accurate, the file was excluded. Radiologist and orthodontist was investigated the hypodontia prevalence of permanent dentition (excluding missing third molars) and its occurrence pattern concerned the involved sides (left vs. right / anterior vs. posterior), tooth types, and gender twice.

Statistical analysis: The chi- square test is to determine the importance of the upper and lower numerical teeth abnormality differences and the differences between genders. Five percent was set as the level of significance.

## Results

For investigation of hypodontia, this study reviewed and examined of a total three thousand patients, in which 1469 were males (48.97%) and 1531 were females (51.03%).

Hypodontia teeth were noticed in 233 patients (139 females and 94 males) and the hypodontia prevalence was 6.39% in male and 9.07% in female, and for both together was 7.76% (Table 1).

A total of 497 permanent teeth were missing (197 in males and 300 in females). Of all cases, one to five teeth hypodontia had a

prevalence of 7.76 % and represented 97.07%. hypodontia of one tooth were found in patients by 37.91% while 40% had hypodontia of two teeth and 9.16% were missing three teeth and just 8.75% were missing four teeth.

**Table 1:** Distribution and frequency of tooth number anomalies between genders

Dental anomalies	Female% n= 1531	Male% n= 1469	Total% n= 3000
Hypodontia	139 (9.07%)	94 (6.39%)	233 (7.76%)
Oligodontia	4 (.26)	3 (.2)	7 (.23)
Hyperdontia	16 (1.04)	18 (1.22)	34 (1.13)
Total	159 (10.38)	115 (7.82)	274 (9.13)

Hypodontia was more regularly noticed in females (9.07% females and 6.39% males), statistically, the difference was significant. Frequently, Maxillary lateral incisors were the most missing teeth (36.61%) which is

followed by mandibular second premolars (22.73%) maxillary second premolars (14.88%), mandibular central incisor (6.63%), and maxillary canine (5.23%).

**Table 2:** frequency of hypodontia in males

Tooth	Upper		Uni		Bi		Lower		Uni		Bi		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Maxilla	Mandible	Total
Central Incisor	3		3		0		4		1		3		3	7	10
Lateral I	48		19		29		10		5		5		77	15	92
Canine	10		6		4		3		1		2		14	5	19
1 premolar	3		2		1		1		1		0		4	1	5
2 premolar	16		8		8		25		9		16		24	41	65
1 molar	1		1		0		0		0		0		1	0	1
2 molar	1		0		1		2		1		1		2	3	5

**Table 3:** frequency of hypodontia in Females

Tooth	Upper		Uni		Bi		Lower		Uni		Bi		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Maxilla	Mandible	Total
Central Incisor	3		1		2		16		6		10		5	26	31
Lateral I	63		21		42		6		4		2		105	8	113
Canine	8		4		4		3		2		1		12	4	16
1 premolar	8		7		1		4		3		1		9	5	14
2 premolar	29		8		21		47		22		25		50	72	122
1 molar	0		0		0		1		0		1		0	2	2
2 molar	2		2		0		0		0		0		2	0	2

**Table 4:** Distribution of the number of missing teeth

Number of missing teeth (Hypodontia)	Female (n=) (%)	male (n=) (%)	Total (n=) (%)
1	50 (20.83)	41(17.08)	91 (37.91)
2	63 (26.25)	33 (13.73)	96 (40)
3	11(4.58)	11(4.58)	22 (9.16)
4	14 (5.83)	7 (2.91)	21(8.75)
5	1 (0.41)	2 (0.82)	3(1.25)
Subtotal	139 (57.91)	94 (39.16)	233 (97.07)
Prevalence	9.07	6.39	7.76
Number of missing teeth (Oligodontia)	Female (n=) Number (%)	male (n=) Number (%)	Total (n=) Number (%)
6	2(0.82)	1 (0.42)	3 (1.25)
7	0	1 (0.42)	1 (0.42)
8	0	1 (0.42)	1(0.42)
9	2(0.82)	0	2 (0.84)
10	0	0	0
Subtotal	4 (1.67)	3 (1.25)	7 (2.93)
Prevalence	0.26	0.2	0.23
Total	143(59.58)	97 (40.42)	240 (100)
%	9.34	6.6	8

Congenitally missing permanent teeth were more frequent in the maxilla (61.98%) than in the mandible (38.02%). Moreover, hypodontia was more frequent in the right side (51.3%) than in the left side (48.7%) of the maxillary and Mandibular arches.

The absence of maxillary lateral incisors in females (105, 21.12%) were more common than males (77, 15.49%).

Absence of maxillary lateral incisors were nearly same in left side than in right side (58:59) and were more bilateral than unilateral.

For investigation of hyperdontia, 34 patients (16 females, 18 male) had supernumerary teeth. The prevalence for male was 1.22% and for female was 1.04%, in total was 1.13% (19 teeth in

male whereas 21 teeth in female). Most common supernumerary tooth was mesiodens (35.29%) which followed by Mandibular first premolar (23.52%) and

maxillary lateral incisor (17.64%). The difference between maxilla and mandible, right and left side for male and female was non-significant.

**Table 2:** Distribution of hyperdontia between sexes by cases and hyperdontia localization

Case	Male	female	total	%	teeth	Male	female	total	%	teeth	male	femal e	total	%
Hypo	18	16	34	1.1	Right	14	11	25	59.5	Maxilla	17	10	27	69.2
Non-hypo	1451	1515	2968	98.8	Left	7	10	17	40.4	Mandib le	2	10	12	30.7
Total	1469	1531	3000	100	Total	21	21	42	100	Total	19	20	39	100
%	48.96	51.04	100		%	50	50	100		%	48.7 2	51.28	100	
Chi sq.	0.08					0.39					5.39			
P value	0.76	Df=1	Ns			0.52	Df=1	ns			0.02	Df=1	S	

### Discussions

The prevalence of hypodontia is between 4% and 11.3% [1-14], however in this study, it was found to be 7.78% which is more than the percentage of studies done in Portugal [1], Iran [15], Venezuela [16], Turkey [17] and Egypt [18], but less than Japan [19] and Korea [20].

Frequently, hypodontia was more noticed in females which was a statistically different significantly. This result is in agreement

with results of some other studies [6, 8,13,14]. Higher prevalence also noticed in females rather than males in several reports [16,19,21] apart from a small group of 217 patients of orthodontic [22].

More frequently, congenitally permanent teeth were missing in the maxilla than in the mandible. This come in accordance to the results in Helton et al. [4] and in contrast to the several other researches [23, 24 25].

**Table 5:** Distribution of Hypodontia between sexes by cases and MT localization

Case	male	femal e	total	%	Teeth	Male	femal e	total	%	teeth	male	femal e	total	%
Hypo	97	143	240	8	Right	104	151	255	51.3	Maxilla	125	183	308	61.9
Non-hypo	1372	1388	2760	92	Left	93	149	242	48.7	Mandib le	72	117	189	38.0
Total	1469	1531	3000	100	Total	197	300	497	100	Total	197	300	497	100
%	48.9	51.03	100		%	39.63	60.37	100		%	39.63	60.37	100	
Chi sq.	6.55					0.19					0.20			
P value	0.01	Df=1	Sig			0.65	Df=1	Ns			0.64	Df=1	Ns	

Moreover, hypodontia was more frequent in the right side than in the left side of the maxillary and Mandibular arches. This is agreeing with Fekonja [12]. Of all cases, one

to five teeth hypodontia had a prevalence of 7.76 % and represented subtotal of 97.07%. In Slovenia, comparative results (87.7%)

were reported by Fekonja [12] among treated children sample.

This study's results coincide with other investigations [19, 25, 26, 27, 28], indicating that involving hypodontia of one or two teeth shows a vast majority of cases. Thus, hypodontia looks to be relatively mild in most cases. Oligodontia showed in seven participants (4 females, 3 males) in this study. The oligodontia prevalence was 0.23%. According to Celikoglu [6], in Turkish population the oligodontia prevalence was 0.3% and it was 0.16% among Danish school students [29].

Maxillary lateral incisors were most frequently missing which is followed by mandibular second premolars and maxillary second premolars, then mandibular central incisor, and lastly the maxillary canine [19, 24,25,27]. Results of previous publishing showed the maxillary lateral incisor [7,9,11,12], followed by the mandibular second premolar [10, 14, 22, 29,30], or the mandibular incisor [22] were the most common congenitally missing teeth. This can be connected to ethnic and racial differences in the populations who were studied.

Generally, in the permanent dentition, diagnosis of missing teeth should be done after age of six years, apart from the third molar which had to be done after ten [24]. Thus, special care should be done to premolars in children before age of seven to avoid false-positive diagnosis. The assessment was always made by considering important publications about the chronology of development of permanent teeth[37,38], the chronology of human dentition[39], and standards of approximate age at which teeth can be expected to be visible on radiographs [1,40]. Secondly, it is mainly hard to differentiate between absence of mandibular lateral and the mandibular central incisors, especially when the remaining teeth have removed or are unerupted [22]. Therefore,

there might be a very few of misclassification between those teeth. That's why some studies, non-specifically, counted such teeth as mandibular incisors [15,19,20]. Thirdly, a further variable is the ethnicity of the subjects examined which the results might be affected. In the literature, there is great variation about most common missing tooth, probably because of ethnic variation. The prevalence is 1% in African Negroes and Australian aborigines, but it could be as high as 30% in Japanese; in Swedish and Japanese, lower central incisors are more often missing compare to other populations [6]. Other researches have showed hypodontia is more regular in Asians and Native Americans [17], and the dental agenesis prevalence in Europe (mostly Scandinavian countries) and Caucasian population in Australia is higher than in North American Caucasians [7].

Results of hyperdonti found that the prevalence was 1.13% while Gábris K. in a study found prevalence of supernumerary teeth were 1.53% [44]. Vahid-Dastjerdi et al. examined radiographs of 1751 Iranian orthodontic patients and reported that 0.74% had supernumerary teeth [45], whereas Udom et al. reported prevalence of 1.8% for supernumerary teeth [46]. The difference in prevalence could be due to different sample size and ethnity of population.

Most common supernumerary tooth was mesiodens which followed by Mandibular first premolar and maxillary lateral incisor [44,47]. While Sogra et al, in a study found most supernumerary teeth were mandibular premolars followed in decreasing order by mesiodens [48].

The difference between maxilla and mandible, right and left side for male and female was non-significant [49].

## **Conclusions**

The study showed that about 9.13% of patients had anomalies of teeth number. Hypodontia happens more often than hyperdontia. Hypodontia was more frequently found in females with significant difference. The most frequently missing tooth was maxillary lateral incisor which is followed by the mandibular second premolars. About hyperdontia, the difference between maxilla and mandible, right and left side for male and female was non-significant. The most frequently found supernumerary tooth was Mesiodens.

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