



An Orthopantomographic study of hypodontia in permanent teeth of Iraqi patients

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Abstract

The congenital lack of one or more permanent teeth is a common anomaly in man. By definition, congenitally missing teeth are those that fail to erupt in the oral cavity and remain invisible in a radiograph, which implies this caused by disturbance during the early stages of tooth development.

389 orthopantomograms of healthy patients were used the number of males were 194 and the number of females were 195. The patients have visited the hospital of college of dentistry of Baghdad university between 2006 and 2008. They were aged between 13 and 27 years at the time the OPGs were taken. All OPGs were analyzed by viewer. The congenitally missing teeth were identified first clinically and confirmed by the OPGs.

The hypodontia mostly seen in upper lateral incisors, and lower second premolar, followed by lower central incisors, upper central incisors, and lastly the lower lateral incisor, there were gender difference in hypodontia, but both genders show high percentage of upper lateral incisors hypodontia, 60.31% for males, and 72.30% for females. The hypodontia of lower second premolar in males 18.56%, and in females 14.5%. The hypodontia of upper central incisors in males 2.577%, and 0% in females. The hypodontia for lower central incisor in males 12.89%, and 13.3% in females. The hypodontia for lower lateral incisors in males 5.67%, and in females 0%. From these percentages it was clear that there were difference in hypodontia of upper and lower arches.

To evaluate the frequency of hypodontia and compare its appearance between males and females and between upper and lower jaw.

Key words: Hypodontia, lateral incisors, congenitally missing teeth.

Introduction

Hypodontia is best defined as agenesis of one or more teeth⁽¹⁾, and considered to be one of the most frequently encountered oral alterations⁽²⁾. Congenital absence of teeth results from disturbance during the initial stage of formation of a tooth.

Hypodontia is an important condition in that both esthetics and function can be detrimentally affected⁽³⁾.

Anodontia, the total absence of teeth, oligodontia refers to congenital absence of many but not all teeth, whereas the term hypodontia implies the absence of only a few teeth⁽⁴⁾.

In dental studies Oligodontia described as a condition involving absence of six or more second teeth excluding the third molar^(5,6).

The tooth most commonly missing is the third molar which is absent in as

much as 20% of population ^(7,8). The second most commonly missing tooth is reported to be the maxillary lateral incisor by some investigators ^(9, 10, 11) or the mandibular premolar by others ^(12, 13). The lowest incidence of tooth agenesis occurs in the lower central and lateral incisors with agenesis of maxillary permanent molars also rare ^(14, 15).

Hypodontia has been identified as both non syndrome, where its an independent congenital oral trait, or syndrome, where it is acquired as par of a specific disease ⁽¹⁶⁾. Both genetic and environmental factors have been found to contribute to the etiology of tooth agenesis with many theories having been suggested to explain their affects, particularly prior to the intensive genetic studies preformed in recent years ^(17, 18, 19, 20).

The purpose of this study was to establish the frequency and percentages of congenitally missing permanent teeth, excluding the third molar, in Iraqi dental patients visiting the college of dentistry department of orthodontic, in addition this study compare the hypodontia in male and females and upper and lower arches by using achi- square test.

Materials and Methods

In this study 389 orthopantomograms of apparently healthy patients (194 males and 195 females) were used for diagnosis of hypodontia, as the approach has been considered reliable for diagnosing anomalies in tooth number in several studies ^(21, 22, 23).

The patients have visited the hospital of college of dentistry of Baghdad University between 2006 and 2008. They were aged between 13 and 27 years (overage 19.4 ± 12.7 years) at the time the OPGs were taken. All OPGs were analyzed by the principal

investigator under normal room lighting using a magnifying glass on a viewer if needed.

Dental agenesis was reassessed entirely by the same investigator 4 months later to establish a definitive list.

A tooth was diagnosed as congenitally missing when could not be identified or discerned radio graphically on the basis of calcification and there was no evidence of extraction. If an accurate diagnosis of hypodontia could not be made the file was excluded.

Third molars were not included in this investigation patients with any systemic anomaly, especially cleft lip/palate and downs syndrome, were also excluded because in such conditions tooth development has been shown to be delayed.

The patients were first examined clinically on dental chair by dental mirror and then confirm the diagnosis by OPGs x-ray.

The chi- square test was performed to determine the significance of the difference for upper and lower hypodontia and the difference between males and females. The level of significance was set at 5%.

Results

Table (1) showed the frequency and percentage, of hypodontia in male patient which showed that 2.577% hypodontia in upper central incisors and 12.89% in lower central incisors, 60.31% in upper lateral incisors and 5.67% in lower lateral incisors, and 18.56% in lower second premolar the other teeth show no any hypodontia.

Table (2) showed the frequency and percentage of hypodontia in female's patients who showed that 0% in upper central incisor and 13.3% in lower central incisors, 72. 30% in upper lateral incisors, and 0% lower lateral

incisors, 14.5% in lower second premolars, all other teeth so any hypodontia.

Table (3) showed the comparison of hypodontia between upper and lower arches for both males and females by using chi-square test, which showed that in males and females high significant difference of central incisors hypodontia between upper and lower jaws, and high significance difference for hypodontia of lateral incisors and second premolar for upper and lower jaws,

Table (4) showed the comparison of hypodontia between male and females for both upper and lower jaws which showed significance difference between hypodontia of central incisors of upper jaw, and high significant for hypodontia of lateral incisor of upper jaw, and high significant different between males and females hypodontia of central incisors, lateral incisors and second premolars.

Discussion

Congenital lack of one or more permanent teeth have been published in the dental literature over the last 50 years of these literature we have able to find few^(21, 22, 23, 24).

Clinical examinations tend to yield underestimation in comparison with systematic and reliable radiographic registration^(25, 26), therefore we considered it convenient to carryout this study based mainly on OPGs and dental history, rather than using clinical examination and plaster models some discrepancies in the results of previous studies can be attributed to the method of case selection the samples under investigation, and the fact that in some of the earlier studies radiographs were either not taken at all or more taken only in cases where examiners suspected a possibility of hypodontia

⁽²⁷⁾. The frequency hypodontia in this study was high in comparison to other studies of pediatric patients^(28, 29, 30), but very similar to that in studies of orthodontic patients^(31, 32, 33).

The results of the study concur with other investigations^(34, 35, 36,37) indicating that hypodontia involving one or two teeth represents a wide majority of cases in this study therefore, most cases of hypodontia appear to be relatively mild.

In this and other studies^(38, 39, 40) there was significant difference between males and females although other studies showed no any significant difference.

This study showed a significant and high significant difference between upper and lower hypodontia which agree with some studies^(41, 42, 43), but other study show no any significant difference^(44, 45).

Other studies^(46, 47, 48) considered that hypodontia could occur alone or as a part of syndrome, for example Ectodermal Dysplasia.

Several explanation have been for warded for the etiology of hypodontia, from the many family cases reports and studies of wins, hypodontia appears to be an inherited characteristic, although the precise genetic mechanism responsible is not completely understood⁽⁴⁹⁾. One explanation has been considered that eventually congenital hypodontia except for hereditary cases has a greater chance of appearing when development of dental germs (I₂, P₂) is later than in surrounding areas and the space for the affected teeth is markedly deficient⁽⁵⁰⁾.

Jorenson⁽¹⁾ mentioned that the frequency of hypodontia might have increased with time as indicated by data for 1939 and those for 1976. in fact I₂, P₂ have been found to be particularly affected in several papers including the present one.

Conclusion

1. Hypodontia seen mostly in lateral incisors for both male and females, followed by second premolar, lower central incisors and lastly for upper central incisors and few percentage for lower lateral incisors.
2. Upper lateral incisors hypodontia in females more than in males.
3. Lower central incisors hypodontia in males more than females.
4. Upper central incisor hypodontia in male more than in females.
5. Lower central incisors hypodontia in females more than males.
6. Lower 2nd premolar hypodontia more in females than males.
7. No any hypodontia seen for upper or lower canine, first premolar, first molar and second molar.

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Table (1)The frequency of hypodontia in males

Tooth	Upper		Uni		bi		Lower		Uni		bi	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Central incisor	5	2,577	5	2,577	0	0	25	12,89	6	3,093	19	9,794
Lateral I	117	60,31	20	10,31	97	50	11	5,67	11	5,67	0	0
Canine	0	0	0	0	0	0	0	0	0	0	0	0
1 premolar	0	0	0	0	0	0	0	0	0	0	0	0
2 premolar	0	0	0	0	0	0	36	18,56	30	15,46	6	3,093
1 molar	0	0	0	0	0	0	0	0	0	0	0	0
2 molar	0	0	0	0	0	0	0	0	0	0	0	0

Table (2)The frequency of hypodontia in females

Tooth	Upper		Uni		bi		Lower		Uni		bi	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Central incisor	0	0	0	0	0	0	26	13,33	25	12,8	1	0,513
Lateral I	141	72,30	121	62,05	20	10,26	0	0	0	0	0	0
Canine	0	0	0	0	0	0	0	0	0	0	0	0
1 premolar	0	0	0	0	0	0	0	0	0	0	0	0
2 premolar	0	0	0	0	0	0	28	14,35	5	2,56	23	11,79
1 molar												
2 molar												

Table (3)Comparison of hypodontia between Upper and Lower arches

	Male			Female		
	Chi-square	P-value	Sig	Chi-square	P-value	Sig
Central incisor	10.364	0.001	HS	30.65	0.000	HS
Lateral I	37.655	0.000	HS	22.685	0.000	HS
Canine	-	-	-	-	-	-
1 premolar	-	-	-	-	-	-
2 premolar	10.65	0.000	HS	8.65	0.000	HS
1 molar	-	-	-	-	-	-
2 molar	-	-	-	-	-	-

*P<0.001 High significant

Table (4)Comparison of hypodontia between Males and Females.

	Upper			Lower		
	Chi-square	P-value	Sig	Chi-square	P-value	Sig
Central incisor	4.06	0.014	S	27.836	0.000	HS
Lateral I	121.845	0.000	HS	6.87	0.000	HS
Canine	-	-	-	-	-	-
1 premolar	-	-	-	-	-	-
2 premolar	-	-	-	27.248	0.000	HS
HSmolar	-	-	-	-	-	-
2 molar	-	-	-	-	-	-

*P<0.001 High significant

**P<0.05 Sgnificant