Congenitally missing and supernumerary teeth among a group of 3-12 years old children with cleft lip and/ or palate in Iraq

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ABSTRACT

Background: There are many congenital anomalies associated with cleft lip and/or palate. This research is to study the prevalence of congenitally missing teeth and supernumerary teeth in this population group.

Materials and Method: One hundred eight cleft lip and/or palate Iraqi patients had participated in this study (57 male, 51 female), 3-12 years of age. 26 of them had orthopantomogram were within (6-12) years of age were inspected for congenitally missing teeth and supernumerary teeth. Patients whom age range 3-5 years were checked for the congenitally missing teeth by clinical examination with strongly insisting the teeth were not missed due to caries or trauma.

Results: There were 19(73.076%) patients with 41 congenitally missing teeth for the 26 patients within 6-12 years age group who were with orthopantomogram, while there were 20(37.037%) patients with 32 congenitally missing teeth for the 54 patients within 3-5 years of age who were not indicated for orthopantomogram. There were (22) patient with (27) supernumerary teeth.

Conclusion: The most frequently congenitally missing tooth was the permanent upper lateral incisor, on the other hand the tooth most frequently noted as extra tooth was the primary lateral incisor. Majority of them were with cleft lip and palate.

Key words: Cleft lip and / or palate, congenitally missing teeth, supernumerary teeth. (J Bagh Coll Dentistry 2015; 27(2):148-153).

INTRODUCTION

Numerical abnormalities are not uncommon in the dentition of the normal population, it is reasonable to consider cleft and normal populations have the backgrounds with similar numerical variations [1,2].

Congenitally missing teeth(C.M.T.), supernumerary teeth (S.N.T.) have been shown to occur more frequently in cleft lip and/or palate children than normal children[3,4].Millet and Wellbury said that on the cleft side, the lateral incisor is either absent, of abnormal size and/or shape, hypoplastic or as two conical teeth on either side of the cleft [5]. Kraus et al, 1966 found 8 cases of S.N.T. in 25 CLP group [6]. The site of S.N.T. was between the central incisor and cuspid in all patients [7].

MATERIALS AND METHODS

One hundred eight CL (P) Iraqi patients had participated in this study (57 male, 51 female), 3-12 years of age. Approval was achieved from Ministry of Higher Education and Scientific Research, and Ministry of Health for examining the cleft patients.

The presence of C.M.T. or S.N.T. had been assessed on O.P.G. if present (26) who were within (6-12) years of age were inspected for C.M.T. and S.N.T.

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Patients whom age range 3-5 years were checked for the C.M.T. by clinical examination with strongly insisting the teeth were not missed due to caries or trauma.

Chi-square was used to assess two categorical variables (frequency of data), such as the presence of C.M.T. according to the type of cleft.

RESULTS

Congenitally missing teeth

Patients with O.P.G. who were within (6-12) years of age were inspected for C.M.T. and the results were demonstrated in table (1). The highest percentage (30.77%) had one or two C.M.T. It is evident from the table that there were 19 patients with 41 C.M.T. in the sample that the O.P.G. was available.

Patients without O.P.G. who were within (3-5) years of age were inspected for C.M.T. clinically and the results were demonstrated in table (2). The highest percentage (50%) had one C.M.T. It is evident from the table that there were 20 patients with 32 C.M.T. in the sample that the O.P.G. was not indicated.

Table (3) demonstrates the presence or absence of hypodontia in different cleft types in the sample with O.P.G, the highest value for the presence of hypodontia is for the CLP with statistically non significant difference (P=0.11). It reveals that 19 from the 26 patients examined are with hypodontia.

Table (4) demonstrates the presence or absence of hypodontia in different cleft types in

the sample without O.P.G, the highest value for the presence of hypodontia is for the CLP with statistically highly significant difference (P=0.0009). It reveals that 20 from the 54 patients examined are with hypodontia.

Table (5) demonstrates the different number of C.M.T. in different cleft types in the sample with O.P.G. The highest accounts are for the CLP patients with one or two C.M.T. with statistically non significant difference.

Table (6) demonstrates the different number of C.M.T. in different cleft types in the sample without O.P.G. The highest accounts are for the CLP patients with one then two C.M.T. with statistically non significant difference.

Table (7) illustrates the frequency and percentage of different types of C.M.T. in the sample with O.P.G. The highest percentage is for the permanent upper lateral incisor with statistically highly significant difference (P=0.001).

Table (8) illustrates the frequency and percentage of different types of C.M.T. in the sample without O.P.G. The highest percentage is for the primary upper lateral incisor with statistically highly significant difference (P=0.0001).

Supernumerary teeth

In the selected sample which comprise (108) patients, there were (27) supernumerary teeth found in (22) patient. Table (9) demonstrates the distribution of patients with no, one, or two S.N.T.

Table (10) demonstrates the frequency and percentage of patients in every type of S.N.T. in the selected sample. The highest percentage was the primary upper lateral incisor (9.2%).

Table (11) demonstrates the frequency and percentage of teeth in every type of S.N.T. in the selected sample. The highest percentage was (40.74%) for the primary upper lateral incisor.

Table (12) demonstrates the number of S.N.T. according to patient with or without O.P.G.. There was a statistically non significant difference (P=0.97).

Table (13) demonstrates the number of S.N.T. according to type of cleft. There was a statistically significant difference (P=0.03).

Table 1: Number and percentage of patients with O.P.G. had different number of C.M.T.

C.M.T. (no.)	Patients with O.P.G.	
	No.	%
0	7	26.92
1	8	30.77
2	8	30.77
4	1	3.85
5	1	3.85
8	1	3.85
Total	**26**	**100**

Table 2: Number and percentage of patients without O.P.G. had different number of C.M.T.

C.M.T. (no.)	Patients without O.P.G.	
	No.	%
1	10	50
2	9	45
4	1	4
Total	**20**	**100**

Table 3: Presence or absence of hypodontia in different cleft types of the sample with O.P.G.

Hypodontia	Diagnosis							
	CL		CP		CLP		Total	
	No.	%	No.	%	No.	%	No.	%
Present	1	3.9	2	7.7	16	61.5	19	73.1
Not present	2	7.7	3	11.6	2	7.7	7	27
Total	**3**	**11.6**	**5**	**19.3**	**18**	**69.2**	**26**	**100**

X^2=7.4 df=2 P=0.11*(NS) Non significant.

Table 4: Presence or absence of hypodontia in different cleft types of the sample without O.P.G.

Hypodontia	Diagnosis							
	CL		CP		CLP		Total	
	No.	%	No.	%	No.	%	No.	%
Present	2	3.7	0	0	18	33.3	20	37
Not present	5	9.3	15	27.8	14	25.9	34	23
Total	7	13	15	27.8	32	59.2	54	100

X^2=14.10 df=2 P=0.0009*(HS) *Highly significant.

Table 5: Different number of C.M.T. in different cleft types in the sample with O.P.G.

C.M.T. (No.)	Diagnosis			
	CL	CP	CLP	Total
1	1	0	7	8
2	0	1	7	8
4	0	1	0	1
5	0	0	1	1
8	0	0	1	1
Total	1	2	16	19

X^2=13.9 df=8 P=0.17(NS)* Non Significant

Table 6: Different number of C.M.T. in different cleft types in the sample without O.P.G.

C.M.T. (No.)	Diagnosis			
	CL	CP	CLP	Total
1	1	0	9	10
2	1	0	8	9
4	0	0	1	1
Total	2	0	18	20

X^2=0.123 df=4 P=0.055(NS)* Non Significant

Table 7: Distribution of different types of C.M.T in the sample with O.P.G.

	Frequency	Percentage
Permanent upper lateral incisor	25	60.98
Permanentlower second premolar	6	14.63
Permanent upper second premolar	6	14.63
Permanent upper central incisor	3	7.32
Permanent lower central incisor	1	2.44
Total	41	100

X^2=66.5 df=4 P=0.001(HS)*** Highly significant

Table 8: Distribution of different types of C.M.T in the sample without O.P.G.

	Frequency	Percentage
Primary upper lateral incisor	25	78.125
Primary upper central incisor	5	15.625
Primary lower central incisor	2	6.25
Total	32	100

X^2=76.8 df=2 P=0.0001(HS) ***Highly significant

Table 9: Distribution of patients with no, one, or two S.N.T.

S.N.T. No.	No. of patients	%
0	86	79.6
1	17	15.7
2	5	4.6
Total	108	100

Table 10: Type of S.N.T. in the selected sample.

S.N.T-Type	No. of patients	%
No	86	79.8
Permanent mesodens	6	5.5
Permanent lateral incisor	2	1.8
Primary mesodens	2	1.8
Primary lateral incisor	10	9.2
Primary central incisor	1	0.9
Primary lower central	1	0.9
Total	**108**	**100**

Table 11: Number and percentage of types S.N.T.

S.N.T. type	No. of teeth	%
Primary mesodens	3	11.11
Permanent mesodens	8	29.63
Permanent upper lateral	2	7.40
Primary upper lateral	11	40.74
Primary upper central	1	3.70
Primary lower centrals	2	7.40
Total	**27**	**100**

Table 12: Number of S.N.T. according to patient with or without O.P.G.

S.N.T. No.	O.P.G					
	Yes		No		Total	
	No.*	%	No.*	%	No.*	%
0	21	19.40	65	60.20	86	79.60
1	4	3.70	13	12.00	17	15.70
2	1	0.90	4	3.70	5	4.60
Total	**26**	**24.10**	**82**	**75.90**	**108**	**100**

X^2= 0.05 df= 2 p=0.97(N.S)**

*** Number of patients, **Non significant**

Table 13: Number of S.N.T. according to type of cleft.

S.N.T. No.	Diagnosis							
	CL		CP		CLP		Total	
	No.*	%	No.*	%	No.*	%	No.*	%
0	7	6.50	24	22.20	55	50.90	86	79.60
1	6	5.60	2	1.90	9	8.30	17	15.70
2	1	0.90	1	0.90	3	2.80	5	4.60
Total	**14**	**13.00**	**27**	**25.00**	**67**	**62.00**	**108**	**100**

X^2= 10.08 df= 4 p=0.03(S)**

***Number of patients, **Significant**

DISCUSSION

Congenitally missing teeth

The presence of C.M.T. had been assessed on O.P.G. if present (n=26), this proportion was low because the children under 6 years of age were not be permitted to take an O.P.G., and this age group constituted a high percentage from the selected sample (50%), also some centers from which the sample collected had no O.P.G. machine, so only this number of patients were able to take this type of x-ray and their age ranges 6-12 years.

There were 19(73.076%) patients with 41 C.M.T. for the 26 patients within 6-12 years age group who were with O.P.G., while there were 20(37.037%) patients with 32 C.M.T. for the 54 patients within 3-5 years of age who were not indicated for O.P.G. These are in accordance with Ranta and Rintala [8]Shapira et al [9] for the first; and with Hellquist et al [10]; Ranta et al [11]; and Abd.Rahman et al [12] for the second; While these values are higher than that of Dahllöf et al [13]; Al-Janabi [14]; and Kirzioğlu et al. [15]. This difference may be due to different racial and ethnic origin, genetic factors, method of examination, sample size and homogenicity, age groups, in addition to surgical procedures.

According to the type of cleft, the majority of the 6-12 years old patients with C.M.T. are under the diagnostic criteria of CLP(61.5%), followed by patients with CP(7.7%), and the least account

is for the CL (9.3%) with statistically non significant difference (P=0.11). This result agree with Fishman, 1970[16], while for patients within 3-5 years of age who were without O.P.G. the majority also (33.3%) were CLP patients, followed by CL (3.7%) and no C.M.T. were observed in isolated CP. These results agree with Kirzioğlu et al [15].

The most frequently congenitally missing teeth were the upper lateral incisor (25 primary teeth, 25 permanent teeth), then the upper and lower second premolar (6) and the primary upper central incisor (5)come next, then the permanent upper central incisor (3 teeth), primary lower central incisor (2 teeth), and the least is for the permanent lower central incisor(1 tooth). These outcomes are similar to that of Jones et al. [17,18]. While these results disagreed with Al-Wahadni et al. [19].

Numerical abnormalities are not uncommon in the dentition of the normal population, where maxillary and mandibular second premolars are the most commonly missing permanent teeth [2]. It is reasonable to consider cleft and normal populations have the backgrounds with similar numerical variations. Thus, these findings suggest that the maxillary lateral incisors are missing more often than they are in normal populations. Millet and Wellbury said that on the cleft side, the lateral incisor is either absent, of abnormal size and/or shape, hypoplastic or as two conical teeth on either side of the cleft [5].

Many theories have been advanced attempting to explain why so many teeth are missing in children with clefts. These theories include multiple genetic and environmental factors, mesenchyme deficiency, and direct effect of cleft on the primordial tissue related to the development of the lateral incisor [20]. Nutritional factors due to an initial lack of bone tissue around the tooth germs or a congenitally inadequate blood supply to the area in question may, instead, be considered to affect the dental development in the cleft area [21]. Viral and bacterial infection may well be a more important etiologic factor than heredity, but only more detailed research can confirm or deny this possibility [7].

Some consider the same etiologic factor or factors seem to be responsible both for the formation of cleft and for advanced hypodontia in children with CLP which are likely result of a prenatal injury interacting with a poorly buffered genotype [22]. Dixon suggested that surgical treatment of the cleft during the period of hard tissue formation of the permanent teeth may affect their development in some cases [23]. Hypodontia is believed to be a consequence of physical obstruction or description of dental lamina, space limitation, functional abnormalities of the dental epithelium, and failure of initiation of the underlying mesenchyme [24].

Supernumerary teeth (S.N.T.)

From the 108 cleft children examined, there are 22(20.3%) children with 27 S.N.T. Five from these 22 patients are with 2 S.N.T., while the remaining 17 are with one S.N.T. for each child. This finding is similar to that of Dahllöf et al [13]. At the same time it is lower than that recorded by Ribeiro et al [25], while it is higher than that of Al-Janabi [14]. This difference may be due to different racial and ethnic origin, genetic factors, method of examination, sample size and homogenicity, age groups, in addition to surgical procedures.

The tooth most frequently noted as extra tooth was the primary lateral incisor (11 teeth), then the primary mesodens (8 teeth), then the permanent mesodens (3 teeth),then permanent upper lateral incisor and primary lower central (2 teeth for each)and the least frequency for the primary upper central incisor (1 tooth). This outcome is in agreement with Fishman [16]; Jones et al. [17,18].

The frequency of S.N.T. in the primary dentition is more than that in the permanent dentition, which is in accordance with Abd-Rahman [12].

By using the O.P.G., from the 26 patients examined, there were 5(4.6%) children with (6) S.N.T. compared to 82 children without O.P.G. in which there are 17(15.7%) with (21) S.N.T. with statistically non significant difference (P=0.97).

According to the type of cleft, CLP had the highest number of S.N.T.(12), followed by CL(7), and the least frequency was for the CP(3) with statistically significant difference. These findings agree with that recorded by Fishman [16]. But disagree with Berkowitz [26]. This result can be explained by the alveolar ridge in isolated CP is not disturbed by the cleft deformity, so it will not affect the tooth germ in its developmental period, as it has been argued that the clefting process splits the tooth germ into two separate teeth [27].

Jones et al 1994 and 2004 said that there is a significant increase in the frequency of S.N.T., often with complete unilateral or bilateral clefts.

Insisting on the somatic effect, Inoue, 1915 supported the idea that the development of a third incisor is attributed to incomplete fusion of the germ of the second incisor. The length of dental lamina is regarded as a determining factor for the number of teeth in the region. Dental lamina is present before the several parts coalesce to form the maxilla. In instances, in which malformation arise, as in case of cleft palate, a lateral incisor cast into the cleft can be split to form a

supernumerary tooth, or be obliterated to be congenitally absent or markedly malformed [27].

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الخلاصة:

المقدمة: توجد الكثير من العيوب الخلقية المصاحبة لشق الشفة و\ أو شق الحنك الولادي. وهذا البحث لدراسة انتشار الاسنان المفقودة ولاديا والاسنان الزائدة ولاديا في هذا النوع من الناس.

الأدوات والطريقة: شارك في هذه الدراسة 108 طفل يعانون من شق الشفة و\ أو شق الحنك الولادي (57 من الذكور, 51 من الاناث) تتراوح اعمارهم من 3-12 سنة. البعض منهم(26 طفل) توفرت لهم الأشعة الوجهية والذين هم بأعمار 6-12 سنة , وتم فحص الاشعة لتسجيل الاسنان المفقودة ولاديا والزائدة ولاديا. بينما الأطفال من عمر 3-5 لا يمكن أخذ الاشعة الوجهية لهم بسبب تأثير الاشعاع لذلك تم الفحص السريري لتسجيل الاسنان المفقودة ولاديا والزائدة ولاديا مع التأكيد على أن الاسنان المفقودة لم يفقدها الطفل نتيجة التسوس او الحوادث.

النتائج: هناك 19(73.076%) من المرضى لديهم 41 سن مفقود ولاديا من ال 26 طفل الذين بين 6-12 سنة من العمر ممن توفرت لنا صورهم الشعاعية بالتصوير الوجهي, بينام هناك 20(37.037%) من المرضى لديهم 32 سن مفقود ولاديا من ال 54 طفل الذين بين 3-5 سنة من العمر ممن لا تتوفر لنا صورهم الشعاعية بالتصوير الوجهي وذلك للخوف عليهم من التأثير الإشعاعي. وهناك 22 مريضا لديهم اسنان زائدة ولاديا (27) سنا.

الخاتمة: السن الأكثر تهورا كسن مفقود ولاديا كان القاطع الثاني الدائمي في الفك الأعلى, والسن الأكثر تهورا كسن زائد ولاديا كان القاطع اللبني الثاني في الفك الأعلى. أكثر الحالات كانت شق الشفة والحنك