

# The Prevalence of Peg Shaped and Missing Permanent Maxillary Lateral Incisors in Najaf City

انتشار عدم وجود القاطع الجانبي العلوي الدائمي وجود القاطع الجانبي العلوي بشكل مخروطي في مدينة النجف الأشرف.

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## الخلاصة:

**الخلفية:** أن عدم وجود القاطع الجانبي العلوي الدائمي أو وجوده على شكل مخروطي يسبب مشاكل في الشكل الجمالي.  
**الهدف:** أن نجد نسبة عدم وجود القاطع الجانبي العلوي الدائمي و نسبة وجود القاطع الجانبي العلوي بشكل مخروطي في مدينة النجف الأشرف.

**المنهجية:** تم إنشاء دراسة مقطعية تكونت من ٤١٦ طالب عراقي (٢١٥ ذكر و ٢٠١ أنثى) و بشكل عشوائي مختارة من ثلاثة كليات من جامعة الكوفة.

تم فحص كل شخص تحت ضوء الشمس في النهار للبحث عن فقدان السن أو إذا كونه بشكل مخروطي.

**النتائج :** أن نسبة عدم وجود القاطع الجانبي العلوي الدائمي كان ٣.٨% (١٦ شخصا) مع عدم وجود فروقات ذو أهمية بين الجنسين.

كان هناك حالتان الفقدان موجود في جانب واحد من الفك و ١٤ حالة موجودة في كلا الجانبين.

أن نسبة الشكل المخروطي للقاطع الجانبي العلوي الدائمي كان ٤.٣% (١٧ شخص) مع عدم وجود فروقات ذو أهمية بين الجنسين.

أن نسبة وجود فراغ بين القواطع الوسطية العلوية في العينة كان ١٥.٤%.

كما وجد علاقة ذو أهمية بين نسبة فقدان أو الشكل المخروطي للقاطع الجانبي العلوي الدائمي أحصائيا مع وجود الفراغ الوسطي للفك العلوي بين القواطع الوسطية.

**الاستنتاجات:** كانت نسبة فقدان أو الشكل المخروطي للقاطع الجانبي العلوي الدائميأحصائيا ذو أهمية مع وجود فراغات بين الأسنان في الفك. بينما نسبة وجود القواطع العلوية الجانبية ليست ذو أهمية مع وجود الفراغ الوسطي للفك العلوي بين القواطع الوسطية.

## Abstract

**Background:** The presence of a missing or peg shaped lateral incisor is a major concern for the subjects facial esthetics.

**Objectives:** The objectives are to find the prevalence of peg shaped and missing permanent maxillary lateral incisors in Najaf City.

**Methodology:** A cross sectional study was constructed and composed of 416 Iraqi students (215 males and 201 females) randomly chosen from 3 colleges of Kufa University in Najaf. Each subject was examined by visual inspection under day light looking for missing or peg shaped permanent maxillary lateral incisors.

**Results:** The prevalence of missing maxillary lateral incisors was 3.8% (16 subjects) with an insignificant gender difference. There were two unilateral missing maxillary lateral incisor and 14 bilateral cases. Prevalence of peg shaped laterals was 4.3% (17 subjects) with an insignificant gender difference.

Maxillary median diastema was found in 15.4% of the sample. Presence of missing lateral incisors showed a significant relationship with the presence of a maxillary median diastema.

**Conclusions:** The presence of missing or peg shaped lateral incisors was found to be statistically significantly related to the presence of spacing and the presence of peg shaped lateral incisor showed a non-significant relationship with the presence of a maxillary median diastema.

**Keyword:** peg shape

## INTRODUCTION:

Microdontia is a term used to describe teeth that are smaller than normal.<sup>(1)</sup> One of the most common forms of localized microdontia is that which affects the

maxillary lateral incisors, called a “peg lateral”. A peg shaped incisor has a marked reduction in diameter, extending from the cervical region to the incisal edge.<sup>(2,3)</sup>

The size of the teeth is predominantly genetically determined, depends on the race and can also be caused due to endocrinal disturbances. The prevalence in most studies varies from 0.8-8.4% of the population.<sup>(4)</sup>

The presence of maxillary peg shaped lateral incisors has been reported either on the left or right side of the jaw. Simultaneous presence of both the upper lateral incisors is a rare case. Simultaneous presence of both the upper lateral incisors is a rare case.<sup>(1, 5, 6)</sup>

The endocrine disturbances affect the size/form of the crown of teeth is not tenable unless such effects occur during morphodifferentiation, in utero or in the first year of life. Size and shape of the root, however, may be altered by disturbances in later periods. Disturbances in morphodifferentiation may affect the form and size of the tooth without impairing the function of the tooth and the function of ameloblast / odontoblasts, thus the result may be a peg shaped/malformed tooth with enamel and dentine that may be normal in structure.<sup>(7)</sup>

Permanent tooth agenesis, maxillary lateral incisor microdontia, palatally displaced canines, and distoangulation of mandibular second premolars are frequently associated with maxillary lateral incisor agenesis, providing additional evidence of a genetic interrelationship in the causes of these dental anomalies.<sup>(8)</sup>

Family studies also indicate that peg shaped upper lateral incisors, impacted canines, rotated bicuspid, and short root anomaly are caused by the same genetic components that cause missing incisors and premolars.<sup>(9)</sup>

Hypodontia, congenitally missing teeth, is common in modern man. The teeth most often missing in populations of European origin are the upper lateral incisors and second premolars. Hypodontia is also often seen in syndromes, particularly in those which present with other ectodermal anomalies, and in non-syndromic patients with cleft lip/alveolus with or without cleft palate.<sup>(10)</sup>

Hypodontia, congenitally missing teeth is more common in permanent than primary dentition.<sup>(11, 12)</sup> A study described the prevalence of peg shaped laterals in the maxilla to be 7.5% in Asians and 1.6% in non-Asians. The occurrence being common in girls when compared to boys.<sup>(13)</sup>

The prevalence of hypodontia and congenital malformation in permanent teeth of Saudi Arabian male children was present in about 2.6-4%; most frequently affected was the mandibular second premolars, maxillary laterals, and maxillary second premolars. Tooth malformations, mainly peg-shaped upper lateral incisors were also observed in about 4 % of the sample.<sup>(11, 14)</sup>

A retrospective study to assess the prevalence and distribution of hypodontia in the permanent dentition, excluding the third molars, in a sample of Japanese orthodontic patients found the prevalence of hypodontia to be 8.5% (7.5% for boys, 9.3% for girls) with no statistically significant difference between the sexes.<sup>(11, 15, 16)</sup>

Peg-shaped and reduced size upper lateral incisors were observed in 2.3% and 2.9% of the sample respectively, in a Jordanian sample.<sup>(17)</sup>

In a retrospective study in Turkey the prevalence of tooth agenesis was 6.2%, missing as a result of the congenital condition. Tooth agenesis was found more frequently in females than in males.<sup>(18)</sup>

In another study in Mexico it has been seen that occurrence of congenitally missing teeth in the permanent dentition of a Mexican population most often affects third molars, followed by maxillary lateral incisors and then mandibular second premolars.<sup>(19)</sup>

## OBJECTIVES

The objectives are to find the prevalence of peg shaped and missing permanent maxillary lateral incisors in Najaf City.

## MATERIALS AND METHODS:

A cross sectional study was constructed and composed of adults aged 18-25 years. They were students randomly chosen from 3 colleges of University of Kufa in Najaf City to give a total of 416 subjects (215 males and 201 females) who met the sample specification criteria.

The sample was selected according to the following criteria: no history of previous orthodontic treatment, no signs and symptoms of any congenital facial deformity, no history of extracted permanent teeth, no history of previous trauma and Iraqi Arabic in origin.

Each subject was examined clinically. He/she was seated on an ordinary chair, with his/her head supported against the wall. The clinical examination included visual inspection under day light looking for missing or peg shaped permanent maxillary lateral incisors. The presence of crowding or spacing of the maxillary anterior teeth was also noted. Median diastema between the maxillary central incisors was also registered.

## STATISTICAL ANALYSIS:

Chi square was used to test the association of the missing or peg shaped lateral incisors with the presence of spacing/crowding or a median diastema. P values of <0.05 were regarded as statistically significant.

## RESULTS:

### Prevalence of missing and peg shaped laterals:

In a random sample of 416 college students, it was found that the prevalence of missing maxillary lateral incisors is 3.8% (16 subjects) being 9 males and 7 females which showed a non-significant gender difference by the use of Chi square test ( $X^2=0.014$ , d.f.=1,  $p>0.05$ ). There were two unilateral missing maxillary lateral incisor (right side) and 14 bilateral cases.

Prevalence of peg shaped laterals was 17 comprising 4.3% of the 400 cases without hypodontia. According to gender, 9 males and 8 females showed peg shaped lateral which showed a non-significant gender difference by the use of Chi square test ( $X^2=0.016$ , d.f.=1,  $p>0.05$ ).

### Relationship with spacing:

The sample was divided into three groups according to the presence of spacing/crowding. One hundred and forty two subjects (34.1%) had spacing and fifty (12.0%) had crowding while 224 (53.8%) subjects were regarded as normal.

**Table 1: Distribution of the total sample according to the presence missing lateral incisors and spacing or crowding of the upper arch.**

Lateral incisor	Spacing	Normal	Crowding	Total
Missing	12 (8.5%)	4 (1.8%)	0 (0.0%)	16 (3.8%)
Present	130 (91.5%)	220 (98.2%)	50 (100.0%)	400 (96.2%)
Total	142 (100.0%)	224 (100.0%)	50 (100.0%)	416 (100.0%)

\* Chi square test ( $X^2=10.789$ , d.f.=2,  $p<0.01$ )

As shown in table 1; subjects with missing lateral incisors comprised 8.5% of the spacing group and 1.8% of the normal group but were not found in the crowding group. This relationship was found to be statistically significant by Chi square test.

**Table 2: Distribution of the sample without hypodontia according to the presence peg shaped lateral incisors and spacing or crowding of the upper arch.**

Lateral incisor	Spacing	Normal	Crowding	Total
Peg	11 (8.5%)	6 (2.7%)	0 (0.0%)	17 (4.3%)
Normal	119 (91.5%)	214 (97.3%)	50 (100.0%)	383 (95.7%)
Total	130 (100.0%)	220 (100.0%)	50 (100.0%)	400 (100.0%)

\* Chi square test ( $X^2=7.014$ , d.f.=2,  $p<0.05$ )

It is clear in table 2 that out of the 400 subjects with present lateral incisors, subjects with peg shaped lateral incisors comprised 8.5% of the spacing group and 2.7% of the normal group but were not found in the crowding group. This relationship was found to be statistically significant by Chi square test.

**Relationship with median diastema:**

Maxillary median diastema was found in 64 (15.4%) of the sample.

**Table 3: Distribution of the total sample according to the presence of missing lateral incisors and presence of median diastema.**

Lateral Incisor	Diastema		
	Yes	No	Total
Missing	8 (12.5%)	8 (2.3%)	16 (3.8%)
Present	56 (87.5%)	344 (97.7%)	400 (96.2%)
Total	64 (100.0%)	352 (100.0%)	416 (100.0%)

\* Chi square test ( $X^2=12.676$ , d.f.=1,  $p<0.001$ )

When table 3 is inspected; it is clear that presence of missing lateral incisors showed a statistically significant relationship with the presence of a maxillary median diastema by Chi square test.

**Table 4: Distribution of the sample without hypodontia according to the presence of peg shaped lateral incisors and presence of median diastema.**

Lateral Incisor	Diastema		
	Yes	No	Total
Peg	3 (5.4%)	14 (4.1%)	17 (4.3%)
None	53 (94.6%)	330 (95.9%)	383 (95.7%)
Total	56 (100.0%)	344 (100.0%)	400 (100.0%)

\* Chi square test ( $X^2=0.007$ , d.f.=1, NS)

However, the presence of peg shaped lateral incisor showed a non-significant relationship with the presence of a maxillary median diastema by Chi square test (Table 4).

**DISCUSSION:**

Researchers like Chung et al <sup>(20)</sup> in Korea, Yamaguchi <sup>(21)</sup> in Japan, Vahid-Dastjerdi et al <sup>(22)</sup> in Iran all showed prevalence rates of congenitally missing upper lateral incisors above that obtained in this study. While, other studies including Maruf <sup>(23)</sup> in Iraq/Sulaimani and Al-Hamdanyet in Iraq/Mosul <sup>(24)</sup> showed lower prevalence rates. This may be attributed to ethnic differences and difference in sampling methods.

A recent study in Iran <sup>(22)</sup> found that there was no statistically significant difference in gender which agreed with the result of this study. However, most studies showed that females are more prone to hypodontia than males like Maruf <sup>(23)</sup> in Sulaimani/Iraq, Al-Hamdanyet al in Iraq/Mosul <sup>(24)</sup>, and Almulla et al <sup>(25)</sup> in Iraq.

Upper lateral incisor was found by some authors to be the most frequently absent tooth. These authors include Maruf<sup>(23)</sup> in Sulaimani/Iraq, Al-Hamdany et al<sup>(24)</sup> in Iraq/Mosul and Vahid-Dastjerdi et al<sup>(22)</sup>.

## CONCLUSIONS

The presence of missing or peg shaped lateral incisors was found to be statistically significantly related to the presence of spacing and the presence of peg shaped lateral incisor showed a non-significant relationship with the presence of a maxillary median diastema.

## REFERENCES:

- 1- Case Report- Coexistent Peg Shaped Mandibular Central Incisors Along with Maxillary Lateral Incisors: A Rare Case. Chanchala HP, Nandlal B. *Int J Oral Maxillofacial Pathology* 2012;3(1):65-8.
- 2- Shafer WG, Hine MK, Levy BL, Tomich CE. *Textbook of oral pathology*. 4<sup>th</sup>ed. Philadelphia: Saunders; 1993.
- 3- Neville BW, Damm DD, Allen CM, Bouquot JE. *Oral and maxillofacial pathology*. 2<sup>nd</sup>ed. India: Saunders; 2004.
- 4- Ezoddini AF, Sheikha MH, Ahmadi H. Prevalence of dental developmental anomalies: A radiographic study. *Comm Dent Health* 2007;24(3):140-4.
- 5- Glavina D, Majstorovic M, Lulic-Dukic O, Jurić H. Hypohidrotic ectodermal dysplasia. *CollAntropol* 2001;25(1):303-7.
- 6- Abd-AzizHM, Foda MY. Prevalence of peg-shaped maxillary lateral incisor in relation to tooth agenesis and malposition of the maxillary cuspids in a group of Egyptian population. *Egypt Dent J* 2004; 50: 545.
- 7- Pinheiro FNM. *Ectodermal dysplasias: A clinical and genetic study*. Alan R Liss Inc., New York: 1984.
- 8- Garib DG, Alencar BM, Lauris JRP, Baccetti T. Agenesis of maxillary lateral incisors and associated dental anomalies. *Am J OrthodDentofacialOrthop* 2010; 137(6):732-3.
- 9- Baccetti T. A controlled study of associated dental anomalies. *Angle Orthod* 1998; 68:267-74.
- 10- Pirinena S, Kentalaa A, Nieminenb P. Recessively inherited lower incisor hypodontia. *J Med Genet* 2001;38:551-6.
- 11- Salama FS, Abdel-Megid FY. Hypodontia of primary and permanent teeth in a sample of Saudi children. *Egypt Dent J* 1994;40(1):625-32.
- 12- Whittington BR, Durward CS. Survey of anomalies in primary teeth and their correlation with the permanent dentition. *N Z Dent J* 1996;92:4-8.
- 13- Rajab LD, Hamdan MA. Supernumerary teeth: review of literature and a survey of 152 cases. *Int J Paediatr Dent* 2002;12(4):244-54.
- 14- Al-Emran S. Prevalence of hypodontia and developmental malformation of permanent teeth in Saudi Arabian schoolchildren. *Br J Orthod* 1990;17(2):115-8.
- 15- Endo T, Ozoe R, Kubota M, Akiyama M, Shimooka S. A survey of hypodontia in Japanese orthodontic patients. *Am J OrthodDentofacialOrthop* 2006;129(1):29-35.
- 16- Peck S, Peck L, Kataja M. Prevalence of tooth agenesis and peg-shaped maxillary lateral incisor associated with palatally displaced canine anomaly. *Am J OrthodDentofacialOrthop* 1996;110(4):441-3.
- 17- Albashaireh ZS, KhaderYS. The prevalence and pattern of hypodontia of the permanent teeth and crown size and shape deformity affecting upper lateral

- incisors in a sample of Jordanian dental patients. *Community Dent Health* 2006;23(4):239-43.
- 18- Cantekin K, Dane A, Miloglu O, Kazanci F, Bayrakdar S, Celikoglu M. Prevalence and intra-oral distribution of agenesis of permanent teeth among Eastern Turkish children. *Eur J Paediatr Dent* 2012;13(1):53-6.
  - 19- Silva Meza R. Radiographic assessment of congenitally missing teeth in orthodontic patients. *Int J Paediatr Dent* 2003;13(2):112-6.
  - 20- Chung CJ, Han JH, Kim KH. The Pattern and prevalence of hypodontia in Koreans. *Oral Dis* 2008; 14: 620-5.
  - 21- Yamaguchi T, Tomoyasu Y, Nakadate T, Oguchi K, Maki K. Allergy as a possible predisposing factor for hypodontia. *Eur J Orthod* 2008; 30(6); 641-4.
  - 22- Vahid-Dastjerdi E, Borzabadi-Farahani A, Mahdian M, AminiN. Non-syndromic hypodontia in an Iranian orthodontic population. *J Oral Sci* 2010;52(3):455-61.
  - 23- Maruf A. Hypodontia of permanent teeth in Sulaimani Governorate, A Master Thesis submitted to the College of Dentistry, Sulaimani University, 2006.
  - 24- Al-Hamdany AKH, Al-Saleem NR, Qasim AA. Angle's classification and hypodontia, is there an association? *Al-Rafidain Dent J* 2007; 7(1): 1-5.
  - 25- Al-Mulla AA, Mahdi TS, Hamid NH. Incidence of Hypodontia of Permanent Teeth. *Tech Res J*1990; 7: 69-80.
  - 26- Goya HA, Tanaka S, Maeda T, Akimoto Y. An orthopantomographic study of hypodontia in permanent teeth of Japanese pediatric patients. *J Oral Sci* 2008;50(2):143-50.