

The prevalence and distribution of hypodontia in 9-16 years old children

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Abstract

Aim: Hypodontia is one of the most common dentofacial malformations that affect individuals, both aesthetically and functionally. Hypodontia or congenitally missing teeth is among dental anomalies with different prevalence in each region. This study aimed to evaluate the prevalence of congenital permanent teeth deficiency according to gender, age and number of missing teeth in children aged 9-16 years.

Material and Methods: In this study, hypodontia cases were examined retrospectively from the panoramic radiographs of patients aged 9-16 years who applied to the Department of Pedodontics of Harran University Faculty of Dentistry between 2018-2019. Age, gender, count and number of missing teeth, jaw and side of the missing tooth were recorded. Descriptive statistical analysis and Chi-square test were used for statistical analysis of the obtained data.

Results: Of the 1036 patients included in our study, 52% (539) were male, and 48% (497) were female. The age average of the patients, whose radiographies were evaluated, was 11. Congenital tooth deficiency (hypodontia) was found in 68 patients, i.e. 6.6% of patients. A total of 123 teeth were missing in 68 patients. Twenty-four of the patients with hypodontia were male, and 44 were female. The relationship between gender and hypodontia was examined by chi-square test, and the result was statistically significant ($p < 0.05$). Mostly missing teeth are respectively; lower second premolar teeth (40.6%), upper lateral teeth (29.3%) and upper second premolar teeth (9.8%).

Conclusion: In our study, the prevalence of hypodontia cases was found to be 6.6% in Sanliurfa, Turkey. Early diagnosis of such a common dental anomaly can lead to successful functional and aesthetic results in a multidisciplinary study. Therefore, dental examinations and radiographic imaging in early childhood are crucial.

Keywords: Hypodontia; congenital missing tooth; dental anomaly

INTRODUCTION

Tooth development (odontogenesis) is a complex process that begins with the interaction of epithelium and mesenchyme cells. Although dental development is a continuous process, it is divided into physiological and morphological phases for identification purposes. A deficiency at the beginning of the tooth development results in the nonformation/absence of one or more teeth (1).

Dental agenesis is defined as the most common dental anomalies, characterized by the congenital non-formation of one or more milk or permanent teeth (2,3). The etiology of dental agenesis is unclear, however some possible factors are as follows: Heredity (mutations of the PAX9 and MSX1 genes), Ectodermal dysplasia, localized

inflammation, trauma, radiation and some systemic disorders such as rickets, syphilis, etc. (4,5).

Dental agenesis can be examined within three classes. Missing one to five teeth except for the third molars can be defined as hypodontia (Figure 1); when six or more teeth are absent, it is called oligodontia. As per anodontia, it is an extreme case representing complete absence of teeth (6).

Hypodontia is the most common developmental dental anomalies in human characterized with one or more missing teeth (7). It was reported in previous studies that the prevalence and location of hypodontia vary between 0.3% and 34.3% among the ethnic groups (4). It was reported in previous studies that the prevalence and location of hypodontia vary between 0.3% and 34.3%

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among the ethnic groups (5,8,9).

This anomaly can cause dental malposition, periodontal damage and decrease in alveolar bone height. Consequently, it can lead to significant functional and aesthetic negative results in chewing and speech functions (10). Early diagnosis of this anomaly is important for the development of more effective treatment options (4,11). Intervention for the missing tooth usually requires multidisciplinary teamwork. The toothless area can be left open for final restoration or closed through orthodontic practices (7,12).

The aim of this study was to determine the prevalence of congenital absence of permanent teeth cases in children 9-16 years of age, and its distribution according to gender, age, and number of missing teeth in Sanliurfa, Turkey.

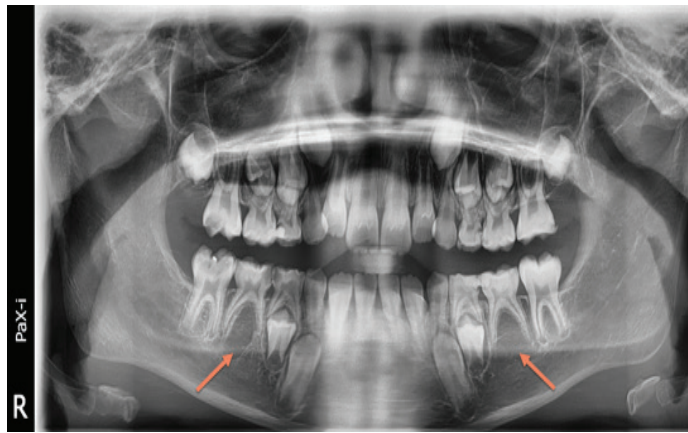


Figure 1. A digital panoramic radiography of a patient with hypodontia

MATERIAL and METHODS

For this study, necessary permissions were gained from the Training and Research Hospital of Harran University (Reference number: 66063783-622.99). In our study, hypodontia cases of patients with 9-16 years of age, treated in Pedodontics clinic of Harran University Faculty of Dentistry between September 2018 and September 2019, were retrospectively reviewed through the digital panoramic radiographs. All radiographs had been taken by Vatech PCH-2500 (Gyeonggi-do, Korea) digital panoramic x-ray device in the oral and maxillofacial radiology department. Among the 1045 radiographs, 1036 were included in the study. 9 radiographs were not included in the study due to lack of clarity and being accompanied by different anomalies (lip-cleft palate, anodontia, etc.). The patients' age, gender, the number and location of missing teeth, jaw and direction information were taken into consideration. While congenitally missing permanent teeth were included in the study, tooth extractions due to trauma, periodontal disease, decay or orthodontic reasons together with the third molar teeth were excluded from the study.

Descriptive statistical analysis and Chi-square test were used for statistical analysis of the data obtained in the

study (at a significance level of 0.05, using IBM SPSS V23 (Chicago, USA)).

RESULTS

Of the 1036 patients participated in the study, 52 % were male (539) and 48 % were female (497). The age average of the patients, whose radiographies were evaluated, was 11. 68 of the 1036 patients, in other words 6.6% of them, had congenital missing teeth. Of these, 24 were male and 44 were female. The prevalence of hypodontia was 9.7% for the females, while it was 4.6% for the males. The relationship between gender and the hypodontia was examined through the chi-square test, and the result was statistically significant ($p < 0.05$) (Table 1). It was observed that a total of 123 teeth were missing in 68 patients. Among the patients with hypodontia, there was one missing tooth in 44.1 % and two missing teeth were detected in 42.6 %. Of the missing teeth, 47.1% were detected on the mandible, 36.8% on the maxilla, and 16.2 % were on the both jaws. Teeth absence was bilateral in 36 patients and unilateral in 32. The most frequently missing teeth were lower second premolar teeth (40.6%), upper lateral teeth (29.3%) and upper second premolar teeth (9.8%), respectively. (Figure 2).

Table 1. Relation between hypodontia and gender

		N	Missing teeth		Total
			Absence	Presence	
Gender	Male	539	515	24	539
	%		95.5%	4.5%	100%
	Female	497	453	44	497
	%		91.1%	8.9%	100%
Total		1036	968	68	1036
	%		93.4%	6.6%	100%
Pearson Chi-Square			Value	df	P
			8,164 ^a	1	.004*

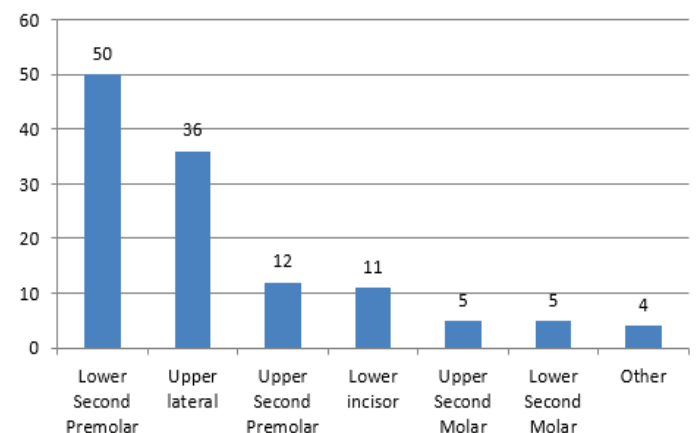


Figure 2. Distribution of missing teeth by tooth number

DISCUSSION

Congenital absence of teeth can be defined in different terms. Hypodontia refers to the congenital absence of one or several milk or permanent teeth (13). On the other hand, the agenesis of many teeth, usually associated with specific syndromes and severe systematic abnormalities, is classified as oligodontia. Anodontia indicates the absence of total tooth structure (7).

There are regional differences concerning the prevalence and distribution of hypodontia in various populations and the exact causes of these differences are unknown. (11). Many studies have been conducted worldwide to assess the prevalence of hypodontia in the populations. In these studies, prevalence values were obtained in a wide range (0.3-34.3%) (4,14-16). In addition to the different sample sizes and selection criteria in the studies, certain factors such as geography, gender, race, and genetic differences played a major role in obtaining these values (3,17).

In a study conducted by Chung et al., evaluating the panoramic and cephalometric radiography of 1,622 patients in Korea, the prevalence of hypodontia was determined as 11.2% (7). In another study conducted by Gomes et al., on 1049 orthodontic patients in Brazil, the prevalence of hypodontia was determined as 6.3% (2). This rate was 5.1% in Sudan population, 6.9% in Slovenia, and 10.9% in Iran (1,4,17). In a study conducted in Turkey (Konya), the prevalence of hypodontia in 2761 patients (except the third molar teeth) was 6.77%. However, in this study, the age range was wide (9-46 years of age) (11). In another study conducted on 2413 patients in Turkey (Kayseri-Kırıkkale), the hypodontia prevalence was determined as 7.54% (18). Finally, another research study conducted on 1,388 patients in Turkey (Izmir) reported this rate as 7.9% (19).

As is seen, different prevalence values were obtained in many studies conducted worldwide. In this study, the lowest rate in similar studies in Turkey, 6.6% was obtained in Sanliurfa. We consider that this may be because of the regional differences as well as the differences in sample size and the selection criteria.

When the distribution of hypodontia between men and women was examined, many publications reported higher rates of missing teeth in women than men; however, this result was not statistically significant (9,17,20,21). In a study conducted by Topkara et al., similarly, there were more cases of hypodontia in women compared to men; however, unlike other studies, this situation was statistically significant (11). In parallel with the aforementioned study, in this study, the relationship between gender and missing teeth was found to be statistically significant with the Chi-square test ($p < 0.05$).

There is also no clarity regarding the most common congenital tooth absence by tooth type. In several studies, it was reported that the lower second premolar teeth have the highest missing rate following the upper lateral teeth

(2,18,22). However, some studies demonstrated that missing in mandibular second premolar teeth is more common than maxillary lateral teeth (19,20,23). In our study, the teeth that were missing the most were lower second premolar teeth (40.6%), upper lateral teeth (29.3%) and upper second premolar teeth (9.8%), respectively.

In a study conducted by Kırzioğlu et al., it was reported that congenital absence of teeth was more common in the mandibular as the arc; in most cases, the absence was bilateral (24). In this study, missing teeth were seen in the lower jaw at 47.1% and in the upper jaw by 36.8% in both jaws at 16.2%. Teeth absence was bilateral in 36 patients, and unilateral in 32 patients.

CONCLUSION

In our study, the prevalence of hypodontia in children 9-16 years of age was found to be 6.6%. Early diagnosis of such a common dental anomaly can bring forth successful functional and aesthetic results through multidisciplinary work. Therefore, dental examinations and radiographic imaging is of vital importance in the early childhood.

Competing interests: The authors declare that they have no competing interest.

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