

Prevalence and characteristics of supernumerary teeth in east-northern Turkish population

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Received: 26 March 2012

Accepted: 10 May 2012

ABSTRACT

Objectives: The aim of the present study was to determine the frequency and the distribution of supernumerary teeth (ST) in patients from east-northern Turkey.

Materials and Methods: A retrospective study was performed using panoramic radiographs of 1876 patients [673 females (mean age: 13.05±2.79 years) and 1203 males (mean age: 13.63±3.18 years)] ranging in age from 7 to 34 years (mean age: 13.39±3.05 years). Demographic variables including age and sex, the type, number, eruption status of the ST were recorded. In addition, associated pathologies or complications (displacement, eruption failure, resorption of adjacent tooth, and cyst formation) caused by ST were also recorded. The Pearson chi-squared test was used to determine potential differences between genders.

Results: ST were detected in 15 patients (0.75 %). The frequency of males and females with ST was 1.16 % and 0.49 %, respectively (P= 0.944). The most commonly observed ST was premolar (33.33%) followed by mesiodens (26.67%), distomolar (20.0%), lateral (13.33%), paramolar (6.67%), respectively. Most of the ST were found to be unilateral, impacted, and in the maxilla. Complications associated with ST were observed in 20.0% of the patients with ST.

Conclusions: The frequency of ST in east-northern Turkish general population was found to be 0.75% with no gender difference (p>0.05). The most commonly observed ST was premolar followed by mesiodens.

Keywords: Supernumerary teeth, hyperdontia, prevalence.

INTRODUCTION

Supernumerary teeth (ST) may be defined as any teeth or tooth substance in excess of the usual configuration of normal teeth development. They most commonly occur in the anterior part of the maxilla, followed by mandibular premolar region.¹ Classification of ST may be on the basis of position or form: Positional variations include mesiodens, premolar, lateral

paramolar and distomolar. Variations in form consist of conical types, tuberculate types, supplemental teeth and odontomes. ST may, therefore, vary from a simple odontome, through a conical or tuberculate tooth to a supplemental tooth which closely resembles a normal tooth. Thus, the site and number of supernumeraries can show a variety.²

Pathogenesis of the ST is associated with trauma during primary dentition, hereditary anomalies (Gardner's syndrome, Cleido-Cranial Dysositis, cleft lip and palate) or alterations of the genetic components responsible for controlling dental development.³ Various complications might occur as a result of the presence of ST, including delayed eruption, crowding, spacing, impaction of

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permanent incisors, abnormal root formation, alteration in the path of eruption of permanent incisors, median diastema, cystic lesions, intraoral infection, rotation, root resorption of the adjacent teeth or even eruption of incisors in the nasal cavity.⁴ The prevalence of ST in general population is estimated between 0.15% - 1.9% and it is reported to be more common in males than in females.⁵

Several reports on the relative frequency of ST occurrence from different parts of the world have been documented.⁵⁻⁷

However, there is only limited data available in the literature about the prevalence of ST in east-northern Turkish populations.^{5,8}

The aim of the present study was, therefore, to determine the frequency and the distribution of ST in patients from east-northern Turkey.

MATERIAL AND METHOD

A retrospective study was performed using panoramic radiographs of 1876 patients [673 females (mean age: 13.05±2.79 years) and 1203 males (mean age: 13.63±3.18 years)] ranging in age from 7 to 34 years (mean age: 13.39±3.05 years) subjected to Karadeniz Technical University, Faculty of Dentistry (Trabzon, Turkey) between 2006 and 2011. Selection criteria of the samples included the patients that were not diagnosed with any syndrome or illness involved odontogenesis and dental eruption. Demographic variables including age and sex, the type, number, eruption status of

the ST were recorded. In addition, associated pathologies or complications (displacement, eruption failure, resorption of adjacent tooth, and cyst formation) caused by ST were also recorded.

All radiographs were reviewed and discussed by the panel in a negatoscope and a 7x lens was used. Inter-examiner discrepancies were solved by consensus and agreement. In addition, randomly selected radiographs of 50 patients were evaluated by another researcher 6 weeks after the initial survey to determine the reliability of diagnosis of the ST. There was 100% agreement between the investigators. The Pearson chi-squared test was used to determine potential differences in the distribution of dental anomalies when stratified by sex. A P value of <0.05 was considered statistically significant.

RESULTS

Distribution of the patients with and without ST was presented in Table 1. ST were detected in 15 patients (0.79 %) whereas 1861 patients (99.2 %) had no ST. The frequency of males and females with ST was 1.16 % and 0.49 %, respectively (P= 0.944). Male to female ratio was observed to be 1:1.5. Age range of the patients with ST was observed between 7 and 18 years with the mean age of 13.07±2.05 years. The age range of the males with ST was between 11-18 years (mean age: 14.17±2.48 years), while this range was between 11-15 years (mean age: 12.33±1.41 years) for females.

Table 1. Distribution of the patients with and without supernumerary teeth (ST).

Gender	Patients with ST	Patients without ST	Frequency	P
Male	9	1194	1.16%	0.944
Female	6	667	0.49%	
Total	15	1861	0.75%	

Table 2. Characteristic features and distribution of the patients with supernumerary teeth.

	Patients	Uni/Bi	M/F	Mandibula/Maxilla	Complication	I/E
Mesiodens	4	4/0	2/2	0/4	2	3/1
Premolar	5	2/3	3/2	3/2	0	5/0
Distomolar	3	3/0	2/1	0/3	0	3/0
Paramolar	1	1/0	1/0	0/1	0	1/0
Lateral	2	1/1	1/1	1/1	1	1/1
Total	15	11/4	9/6	4/11	3	13/2

Uni/Bi: Unilateral/Bilateral; M/F: Male/Female; I/E: Impacted/Erupted

Table 2 showed the characteristic features and distribution of the patients with ST. Nineteen ST were observed in 15 patients. In four of the patients, the ST were found to be bilateral. The ST were observed either in maxilla or in the mandible. In 11 of the 15 patients, ST were observed in the maxilla (73.3%). The most commonly observed ST was premolar (33.33%) followed by mesiodens (26.67%), distomolar (20.0%), lateral (13.33%), paramolar (6.67%), respectively. In 13 patients, the ST were impacted, while they were erupted in 2 patients. All erupted ST were unilateral. One of them was a mesiodens in the maxilla and the other one was a lateral in the mandible. Those erupted ST caused dislocation of the permanent teeth. One of the other mesiodens caused delayed eruption of maxillary central incisors. As a result, complications associated with ST were observed in 3 out of 15 patients (20.0%). Cyst formations, enlargement of the follicular epithelium or root resorption were not found in any of the cases. No other dental anomalies associated with ST were detected.

DISCUSSION

The etiology of ST remains unclear; however a few theories have been suggested. It may be seen as an isolated finding or as a part of a syndrome, specifically cleft lip and palate and cleidocranial dysostosis.⁹ A genetic basis for ST was suggested considering

observation of a higher rate of hyperdontia among related families.¹⁰ In some syndromes, such as cleidocranial dysostosis and Gardner's syndrome, when ST occur as part of its symptoms, the genetic basis might play an important role.¹¹ It has also been mentioned that environmental factors might play a role in the occurrence of supernumerary teeth as well as splitting of the tooth bud or the dichotomy theory.¹²⁻¹⁴ According to the dichotomy theory, Taylor argued that splitting of the tooth bud into two equal or unequal sections may either form two equal sized teeth or one normal and one dysmorphic tooth.¹⁴⁻¹⁶ The hyperactivity theory, which is the restricted increase in the activity of dental lamina, may be considered as the most acceptable etiologic factor in the development of supernumerary teeth.¹⁶ Although ST have been associated occasionally with hereditary anomalies, no syndromes were evident in any of our cases.

Although there are several reports on the relative frequency of ST, there is limited information in the relative frequency of general patient population. According to the literature, ST occur most frequently in the first decade of life. In our study, the age range was between 11 and 18 with a mean age of 13.0 years, which is consistent with the literature.¹⁷

The reported ST prevalence in general population is estimated between 0.15% - 1.9 %⁷ In the present study, the frequency

of ST was 0.75% and more frequently observed in males with a male female ratio of 1.5/1. It was in agreement with previously published studies^{5,8} showing that ST were more frequently observed in males. However, this difference between genders was not found to be statistically significant ($p=0.944$) as stated by Esenlik.⁸ The possibility of genetic transmission via an autosomal dominant trait with lack of penetration has been observed and an X-linked inheritance has even been documented which can explain sex dominance in this anomaly.¹⁸ Thus ST were reported to be more common in males than females that is consistent with our findings.¹⁹

In the present study, approximately 75% of the patients had ST in their upper jaw and most of the ST were found to be unilateral. In addition, 13 out of 15 patients had impacted ST. These findings are very close to the data published by Celikoglu et al.⁵ who showed that 75% of the ST were single, 68.8% were observed in the maxillary arch, and approximately 80% were impacted.

The most commonly ST observed in the present study was found to be premolar (33.33%) followed by mesiodens (26.67%), distomolar (20.0%), lateral (13.33%), paramolar (6.67%). Yusuf²⁰ showed in his review that the most commonly observed type of ST was premolars. However, it was stated that the mesiodens was the most commonly observed type in some studies.^{5,8}

Various complications might occur as a result of the presence of ST, including delayed eruption, crowding, spacing, impaction of permanent incisors, abnormal root formation, alteration in the path of eruption of permanent incisors, median diastema, cystic lesions, intraoral infection, rotation, root resorption of the adjacent teeth or even eruption of incisors in the nasal cavity.^{5,20,21} Delayed eruption of the permanent teeth and displacement of permanent maxillary incisors were stated

to be the most commonly observed complications of ST.²² On the other hand crowding, maxillary median diastema, dilaceration of permanent teeth, cyst formation and inverted eruption are also presented.²³ In the present study, complications associated with ST were observed in 3 out of 15 patients (20%). Cyst formations, enlargement of the follicular epithelium or root resorption, and dental anomalies were not found in any of the patients with ST.

CONCLUSION

The frequency of ST in east-northern Turkish general population was found to be 0.75% with no gender difference ($p>0.05$). The most commonly observed ST was premolar followed by mesiodens. Complications associated with ST were observed in 20% of the patients with ST.

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