

Dental anomalies in a population of Saudi Arabian children in Tabuk

Oliver O. Osuji*, BDS, Dip Paedodont, MSc and John Hardie†, BDS, MSc, PhD, FRCDC

هدفت هذه الدراسة إلى تحديد مدى شيوع فقدان أو زيادة عدد الأسنان بما فيها الأسنان الزائدة سبب التكون عند الخط الأوسط للفك العلوي، الأسنان الملتحمة، حديدات تالون لدى الأطفال المراجعين للمستشفى الشمالي الغربي للقوات المسلحة في منطقة تبوك. تمت هذه الدراسة سريريًا وإشعاعيًا أثناء الفحص الاعتيادي للمرضى، أحررت الدراسة على 1878 طفل وكان من بينهم 115 طفل لديهم تشوهات سنية ونسبة 6.8% طفل لديهم 133 سن دائم مفقود، 42% منهم أحادية الجانب، 37% ثنائية الجانب، 3% ثلاثية الجانب، 18% رباعية الجانب. كان السن الضاحك السفلي الثاني النسن الأكثر فقدانًا (48%) 11 طفل كان لديهم أسنان زائدة لينة، 13 طفل لديهم أسنان زائدة سنية التكوين، 7 أطفال لديهم أسنان لينة ملتحمة، 9 أطفال كان لديهم تشوهات سنية متعددة سواء كان زيادة أو نقص أو التحام الأسنان.

The purpose of this study was to determine the prevalence of missing teeth, supernumerary teeth including mesiodens, fused teeth, and talon cusps in children attending the North West Armed Forces Hospital, Tabuk. The investigation was conducted clinically and radiographically during routine examination of the patients. The study group consisted of 1878 children of whom 115 had dental anomalies. Sixty-eight children had 133 permanent teeth missing, 42% unilaterally, 37% bilaterally, 3% trilaterally, and 18% quadrilaterally. The most frequent missing tooth was the mandibular second premolars (48%). Eleven children had supernumerary primary teeth, thirteen children had 16 mesiodens, and seven had fused primary teeth. Nine children had multiple anomalies of missing, fused and supernumerary teeth. Early identification of anomalies is useful for planning comprehensive management, initiating interprofessional consultation or referral for evaluation and treatment, and for intercepting functional and aesthetic disharmony in the dynamic occlusion of a young child.

Introduction

Most of the reported data on congenital dental anomalies are case reports of missing teeth, supernumerary teeth, fused teeth, talon cusps, and others. Some reports however are large-series studies of various anomalies in children.¹⁻⁶ These studies were mostly on Caucasians and Mongoloid populations. Data on other populations in general and Arabs in particular are few. The anomalies which occur most frequently in children are missing teeth, supernumerary teeth, fused teeth and peg lateral incisors.^{1,2} It is important for every practitioner to know the relative frequency of anomalies in his/her locale in order to counsel those who may have any of these anomalies and who may seek treatment.

The purpose of this study was to determine the prevalence of some selected dental anomalies namely congenitally missing primary and permanent teeth, talon cusps, supernumerary teeth including mesiodens, and fused teeth. The investigation was conducted during routine dental treatments of children attending a military hospital in Tabuk, which is one of the oldest cities in the Kingdom of Saudi Arabia. The definitions of dental anomalies in the study are as defined in standard texts.^{7,8}

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*Formerly, Consultant Paedodontist

†Formerly, Chairman, Department of Dentistry

King Fahad National Guard Hospital

P.O. Box 22490

Riyadh 11426 Saudi Arabia

Materials and Methods

The study consisted of both clinical and radiographic examinations. A dental mirror, probe, standard dental light and chair were utilized during the comprehensive clinical examination. The absence of teeth normally expected to be erupted, and the presence of erupted supernumerary teeth, were determined by counting the erupted teeth in the arch. Talon cusps and fused teeth were identified by their characteristic shapes. Radiographic examination was done on panoramic views of the jaws, periapical and occlusal views of the anterior teeth. The radiographs were read on a dental viewer. Only abnormalities occurring anterior to the first permanent molars were included. Anomalies, single or combined, were recorded on printed forms. Children with a history of loss due to trauma, or extraction, cases of ectodermal dysplasia, Down's syndrome, cleft lip and palate, and radiation of the face were excluded.

Results

There were 64 males and 51 females with dental anomalies (Table 1). Fifty-one percent of the anomalies occurred in males, and 48.9% in females. Overall, 101 (53.7%) of the 188 anomalies occurred on the right side, 83 (44.1%) on the left,

Address reprint requests to:

Dr. Oliver O. Osuji

Dept. of Oral and Dental Surgery

King Khalid National Guard Hospital

P.O. Box 9515, Jeddah 21423

Saudi Arabia

Table 1. Distribution of 188 anomalies in 115 out of a total of 1878 children.

	n=64 males	%*	n=51 females	%*	%* Prevalence of 188
Missing permanent	62	64.6	71	77.2	70.8
Missing primary	1	1.0	5	5.4	3.2
Super-numerary permanent	2	2.1	0	0.0	1.1
Super-numerary primary	8	8.3	3	3.2	5.9
Super-numerary (Mesiodens)	9	9.4	7	7.6	8.7
Fused primary	5	5.2	2	2.2	3.7
Talon cusp, permanent	7	7.3	2	2.2	4.8
Talon cusp, primary	2	2.1	2	2.2	2.1
Total	96	100	92	100	100

*may be more or less than 100 due to rounding off

Table 2. Missing permanent teeth in 68 children.

	Missing teeth	%
Mandibular 2 nd premolar	64	48.1
Maxillary 2 nd premolar	33	24.8
Maxillary lateral incisor	26	19.5
Mandibular lateral incisor	6	4.5
Mandibular central incisor	4	3.0

and 4 (2%) in the maxillary midline.

Missing permanent teeth

One hundred and thirty-three permanent teeth were congenitally missing in 68 children, while six primary teeth were missing in five children (Table 1). Mandibular second premolars were the most commonly missing teeth (Table 2). One tooth was missing in 42.6% of the children, two teeth in 36.8%, three teeth in 2.9% and four teeth in 17.6% respectively. The pattern of hypodontia and relative frequency of teeth affected are shown in Table 3.

Table 3. Hypodontia in permanent teeth.

Hypodontia	Relative frequency of teeth*
1. One missing tooth 29 (42.6%) children	35>45>12>22,42,31,15>41
2. Two missing teeth 25 (36.8%) children	35;45>12;22>15;25>32;42
3. Three missing teeth 2 (2.9%) children	15, 25, 35
4. Four missing teeth 12 (17.6%) children	15, 25, 35, 45

*FDI two-digit system of permanent tooth notation:

1. Tooth 35 was more frequently missing than 45 which is more frequently missing than 12; however, 22, 42, 31 and 15 have equal missing frequency; 41 was least frequently missing.
2. When 2 teeth were missing bilaterally, mandibular second premolars were more frequently missing than maxillary laterals.
3. When 3 second primary molars were missing, they were the maxillary premolars and mandibular left premolar.
4. When 4 teeth were missing, they were the second premolars.

Missing primary teeth

The missing primary teeth were lateral incisors. Of the six children, five were girls. Three were missing in the maxilla and three in the mandible.

Supernumerary in primary dentition

Eleven children exhibited supernumeraries of the primary dentition (Table 1), nine of which were of the lateral incisors.

Supernumeraries in permanent dentition: Mesiodens

The supernumeraries were 29, seen more in the maxilla 23 (79%) than in the mandible 6 (21%). Relative frequencies were mesiodens 55%, lateral incisors 35% and canines 10%. Thirteen mesiodens were positioned in the usual downward direction of tooth eruption, 2 were inverted and one was horizontal. Four mesiodens were located in the exact midline between the centrals, 7 were located closer to the right central, and 5 closer to the left central incisor.

Fused teeth

These were seen exclusively in the mandibular primary teeth of five males and two females (Table 1). Five of the fused teeth involved the right lateral

incisor and canine, and one involved the right central and lateral incisors, and the only one on the left side involved the lateral incisor and canine.

Nine children, mostly girls, exhibited multiple occurrences of missing primary and permanent teeth, mesiodens and fused teeth.

Talon cusps

In the permanent teeth, talon cusps were seen in the maxillary central incisors in 7 males and 2 females, while in the primary dentition, they were seen in three canines and one central incisor.

Discussion

Developmental dental anomalies are frequently observed during routine dental examinations. Early identification of a treatable anomaly is important in planning comprehensive management of the young child. These anomalies develop before the eruption of the teeth, and are often familial.⁷ However, since their effects may commence with the eruption of either or both primary and permanent dentitions and persist throughout life, some of the undesirable effects should be preventable. Functional, aesthetic and occlusal disharmony may be recognized sufficiently early to demand interprofessional consultation and treatment in specific cases.

This investigation supports the findings of previous studies which reported that congenitally missing permanent teeth were the most prevalent dental anomaly of children,²⁻⁵ with an almost even gender distribution.² It also supports the finding that missing primary teeth occur less frequently than missing permanent teeth.

While some investigators reported the mandibular second premolar as the most frequently missing permanent tooth,²⁻⁵ others indicated it to be the maxillary permanent lateral incisor.¹ In this study, the mandibular second premolar was the most frequently missing, accounting for 48% of all missing permanent teeth.

Six congenitally missing primary teeth noted in five children in this investigation are similar to the results obtained by Clayton.² However, absent primary teeth were not recorded in McKibben's study.⁴ One study was exclusively on permanent teeth³ while another did not categorize findings according to primary and permanent dentitions,⁵ thus making comparisons to this study difficult. While Clayton² observed missing primary incisors, cuspids and first molars, all the missing primary

teeth in the present study involved lateral incisors.

In agreement with similar studies, the present one found an almost even gender distribution in the prevalence of congenitally missing permanent teeth.^{2,4} Castaldi³ reported more missing permanent teeth in females than males in the ratio of 12 to 7. However, in the present study, missing primary teeth tended to occur more in females than males.

Ravn⁹ reported twice as many missing primary teeth in the maxilla than in the mandible. Missing primary teeth in this survey were observed in equal numbers in the maxilla and the mandible. They involved the lateral incisors, and were in agreement with Ravn⁹ except that his findings included also a missing mandibular canine.

Studies on maxillary anterior supernumerary teeth reported that they occurred more frequently in males than females.^{3,10-13} The present results support this finding. Supernumerary teeth occur frequently in the permanent dentition, more so in the anterior region as mesiodens than any other part of either dental arch.^{9,10} Mesiodens are reported to occur slightly more on left than right side of the midline.^{10,12} This study observed it slightly more on the right than on the left side of the midline which is in agreement with Huang.¹⁴

In this study, supernumerary primary teeth were observed to occur more frequently on right than left dental arch. This is consistent with other reports.^{1,9} Nine of the 11 supernumeraries involved lateral incisors in this study, comparable to the 10 out of 11 that involved laterals reported by Luten.¹⁰ The M/F ratio of supernumeraries in this study was 8:3 in contrast to Luten¹⁰ who reported no difference between the sexes.

Fusion of teeth accounting for 0.3 per cent, was lower than what other studies^{1,4,5,9} reported and was observed to occur unilaterally, in agreement with Gellin,⁶ and exclusively in the mandible, in agreement with Menczer¹ and Ravn.⁹ Others^{5,6} reported that fusion of central and lateral incisors occurred more than of lateral incisor and canine which was the finding in this study.

Talon cusp is an unusual and relatively rare anomaly which most frequently affects the maxillary permanent incisor. Some reports indicate that the mandibular permanent incisor,^{15,16} maxillary permanent canine,^{17,18} maxillary primary incisors,¹⁶⁻²⁰ and maxillary primary canine¹⁷ can also be affected. When the projection from the cingulum area is asymmetrical, as in one of the cases in this series, the tooth resembles a fused tooth or supernumerary. When this occurs in the maxillary midline, it may be

mistaken for a mesiodens.

The simultaneous occurrence of various multiple dental anomalies is rare, but has been reported.^{18,20,21} Most of them are associated with syndromes, although some do occur in individuals without evidence of multisystem involvement. This supports the suggestion that the aetiologies of these anomalies are related, and that tooth anomalies need to be studied as composites rather than as isolates.¹⁷

In conclusion, the results of this study showed that congenital dental anomalies were present in 6% of the children. Missing teeth were the commonest anomalies, occurring more in females with the mandibular second premolars as the most frequently missing. Missing primary, supernumerary and fused primary teeth, and talon cusps on permanent teeth, were more common on the right dental arches.

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