

A Radiographic and Clinical Survey of Dental Anomalies in Patients Referring to Shiraz Dental School

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ABSTRACT

Statement of Problem: Many epidemiological surveys have been conducted in different parts of the world to determine the prevalence of various types of dental anomalies. There are regional and ethno-racial variations in the prevalence of dental anomalies.

Purpose: To assess the prevalence of dental anomalies in a group of Iranian dental patients in Shiraz dental school, Iran.

Materials and Method: 414 dental patients referring to dental school and aged between 15-60 years old (257 female and 157 male) were examined clinically and radiographically for the presence of dental anomalies, using orthopantomography. Data were collected and analyzed by Chi-square and Fisher exact tests.

Results: Fluorosis was the most prevalent anomaly (7.72%) followed by missing of the wisdom teeth (7%), impaction of teeth (4.34%), microdontia (2.89%), missing of the mandibular second premolars (2.65%), supernumerary teeth (2.4%), missing of the maxillary lateral incisors (1.6%), dilaceration (1.44%), invagination (1.44%), and taurodontism (0.96%).

Conclusion: In the comparison of these results with those of other studies, it was indicated that these anomalies occur at different frequencies among various countries and communities in the world. Recognizing these anomalies will facilitate the endodontic, prosthodontic, periodontic and surgical management of such teeth.

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Introduction

The form, size and color of the teeth as well as their eruption times in human reveal wide, normal and biological variations. Among different populations of the world, abnormal variations, however, do occur. In many cases, these are due to genetic, environmental and pathological factors, or perhaps, part of systemic or syndromic disorders [1-2].

According to Sarnat & Schour [1], the growing tooth is the biological recorder providing precise and permanent record of variations and fluctuations in the tooth development and its mineralization. These anomalies may be localized to one tooth or generalized to involve all the teeth or they might be part of systemic or syndromic disorders [2].

Developmental anomalies of the dentition are not

infrequently observed in the dental clinic. However, while these anomalies account for a relatively low number compared to the more common oral disorders such as dental caries and periodontal diseases, their clinical management is usually complicated as they present with malocclusion, esthetic problem, and possible predisposition to other oral diseases.

Many epidemiological surveys have been conducted in different parts of the world to determine the prevalence of various types of dental anomalies [3-11]. The results have shown that there are regional and ethnorracial variations in the prevalence of dental anomalies. Since many of these studies were conducted without radiographic assessment, the prevalence of some abnormalities such as hypodontia can be overestimated and supernumerary teeth may have been underestimated.

Obviously, identifying abnormalities in tooth morphology, size or eruption pattern, and the impact of these conditions on the treatment plans and prognosis will improve the dental services delivered to the patients. Besides, the lack of sufficient previous studies in this filed necessitates new research.

This paper presents the results of a clinical and radiographic survey of the anomalies of tooth morphology and number in patients referring to Dental School, Shiraz, Iran and compares them with other reports.

Materials and Method

The subjects of this cross-sectional study were patients who attended the dental clinics of Shiraz Faculty of Dentistry during December 2007-May 2008. In this study, 414 subjects aged 15-60 years old (257 females and 157 males) were included. For all of these patients, radiographies were ordered by other dentists for routine dental treatments. Each patient was examined clinically for dental anomalies using dental mirror with sufficient light. The clinical details including the patient's age and gender, and the number, size and shape of the dentition were carefully checked,

and all the abnormalities were recorded. These clinical details were undertaken by an experienced clinician. The panoramic views of these patients were carefully analyzed by one of the authors (radiologist), using magnifying lens and X ray viewer for any anomalies in a dark room. The data were collected and statistically analyzed, using Chi-Square and Fisher exact tests. The history of extraction of the permanent teeth was taken and the subjects with incomplete dentition without a history of extraction were included in this research for evaluation of the missing teeth.

Microdontia and macrodontia were considered as inherited conditions that produce at least one disproportionately small or large tooth. Impaction was regarded as a tooth that is not expected to erupt completely into its normal functional position based on chronologic, clinical and radiographic assessment.

Anomalies such as hypodontia and supernumerary teeth were established by clinical counting of the teeth and confirmed by radiographs. The size of the teeth was morphologically determined by clinical and radiographical evaluation for microdontia and macrodontia. Gross deviations in size which were easily discernible by clinical judgment were mentioned. The presence of taurodontism was defined as an apical displacement of the pulp chamber, elongation of the tooth trunk and shortened roots without the usual constriction at the cemento-enamel junction. Dilaceration was determined radiographically as any kink or sharp bend on the crown or the root of the teeth. Invagination was diagnosed clinically and confirmed by periapical radiographs as an accentuated depression and/or pit in the singular areas of the incisors projecting inward within the substance of the tooth.

Results

The incidence of selected dental anomalies is shown in Table 1. There were 157 dental anomalies in 140 patients. Twelve patients (33.8%) showed more than one anomaly. An 18 year old man showed 5 dental anomalies simultaneously (missing of both mandibu-

lar wisdom teeth, dilaceration of the right canine and first premolar of the mandible, taurodontism in the first and second maxillary molars, invagination in the left maxillary incisor and missing of the left mandibular lateral incisor.

Table 1 Incidence of tooth abnormalities in patients

Type of Abnormality	Incidence (%)
Fluorosis	7.72
Missing of wisdom teeth	7
Impaction (3 rd molars excluded)	4.34
Missing of mandibular 2 nd premolar	2.65
Microdontia (Max. lateral excluded)	2.89
Peg lateral	2.17
Supernumerary teeth	2.4
Missing of maxillary lateral incisor	1.6
Dilaceration	1.44
Invagination	1.44
taurodontism	0.96

Fluorosis was the most prevalent anomaly (7.72%) observed in 32 patients (11 males and 21 females), while taurodontism was the least (0.96%). There was no significant difference between the sexes in each anomaly ($p < 0.05$).

In this study, missing of the wisdom teeth was the second prevalent anomaly, seen in 29 patients (7%) (9 men and 20 women). Analysis of the data of this anomaly showed that the left mandibular third molar accounted for 1.45% of all the anomalies.

Impaction of teeth (third molars were excluded) were seen in 18 patients (10 males and 8 females). The prevalence of this anomaly was 4.34% and impaction of the canine was seen in 17 patients (4.1%). Impaction of the left maxillary second premolar was seen in one subject. Microdontia was seen in 12 patients (5 males & 7 females). The data showed that the third molar involvement was more prevalent (8 patients) followed by the second molar (three patients) and the first molar (one patient). Peg lateral was also seen in nine patients (2.17%), occurring bilaterally in most cases.

Missing of the mandibular second premolars was seen in 11 patients (seven males and four females).

Supernumerary teeth were seen in 10 patients (two males and eight females). Mesiodense was observed in four patients and distomolar in 4 patients. Two women showed bilaterally distomolars in the upper jaw. One patient showed supernumerary tooth in the mesial of the left maxillary canine and the other one distal to the right maxillary canine.

Missing of the maxillary lateral incisors was seen in seven patients (two males and five females) and in two cases they were bilateral. In three cases, the left maxillary incisor was involved. Dilaceration was seen in six patients (two males and four females). Also, invagination was seen in six patients (four males and two females). In three cases, invagination was bilateral and in the others it was unilateral. Taurodontism was seen in four patients (three males & one female). The second molar involvement was more prevalent than the first and third molars involvement.

Discussion

The data of the present study were collected from Iranians who attended oral medicine and radiology departments of Shiraz Dental School. Caution was taken in extrapolating the results of the present survey to larger population. However, data such as these can serve as an indicator of dental anomalies in the larger community and how they may affect the overall pattern of dental treatment provided in the community. In this survey, the prevalence rate of ten most commonly occurring dental abnormalities was examined. While the prevalence of these abnormalities are quite low compared to other common oral and dental disorders such as dental caries and periodontal diseases, they present a challenge to the practitioner as they may complicate the treatment of common dental diseases like caries.

Fluorosis accounted for the highest prevalence at 7.72%. This figure was generally lower than those from other population groups. Conway et al [12] reported a prevalence of 49% at any level and 4% with esthetic concern. Tabari et al. [13] reported a

prevalence of 23% fluorosis in the fluoride deficient area and 54% in the fluoridated area in relation to water fluoridation, social deprivation and toothpaste use in infancy. Do et al. [14] report a prevalence of 22.1-34.7% fluorosis among the South Australian children.

Missing of wisdom teeth accounted for 7% prevalence in this study. This was generally lower than those from other population groups. Goren [4] reported a prevalence of 38.5% missing of the third molars in 18 year-old army recruits, in occupied Palestine.

Impaction of teeth accounted for 4.34% prevalence in the present research. Ezodini et al's [15] results were different from those of ours (8.3%). They examined 480 panoramic radiographs of patients attending dental faculty of Yazd. The results of this study were similar to ours in some other respects.

Microdontia (2.89%) and peg lateral (2.17%) were common dental anomalies in this study. Our figure is higher than that reported by Salem (0.37%) [16] in Gizan and the Nigerian figure of 1.4% reported by Onyeaso [17], and near to 2.3 % reported by Albas-hireh in Jordan [8].

Missing of the mandibular second premolars accounted for 2.65% prevalence. Nordgarden reported a prevalence of 2.1% for such anomaly in Norway. [7]. Maatouk and coworkers [6] reported a prevalence of 13.3% for hypodontia in Tunisia and missing of the second premolars accounted for 30.6% of all the subjects.

In this study, the prevalence of the supernumerary teeth was 2.4%. It was higher than the figure of 0.5% reported by Salem [16] in Saudi Arabia and lower than Onyeaso's results (14%) [17] in Nigeria. Ezodini [15] found that this anomaly accounted for 3.5% of all the dental anomalies among Yazdi (Iran) patients.

Missing of the maxillary lateral incisors accounted for 1.6% prevalence in this study. Our result is similar to that of Pinho [5]. He reported a prevalence of 1.3% for such anomaly. Absence of these teeth was bilateral in 44.7%. Nordgarden reported a prevalence

of 0.9% for this anomaly in Norway [7].

Crown and root dilacerations constitute 3% of traumatic injuries to the developing teeth. In this study, the prevalence of dilaceration was 1.44% which is lower than 3.78% as reported by Hamasha [10] in Jordan. Malcic and coworkers [11] in Croatia reported that the mandibular third molars had the highest prevalence of root dilacerations followed by the maxillary first molars. Our results showed that the mandibular first and third molars were the most common teeth for dilacerations. No maxillary case was seen.

Ezodini's research [15] performed in our country was more similar to our study, but the results are significantly different. She found dilacerations to be the most common abnormality in the population studied. It is thought that dilacerations could not be properly diagnosed in panoramic views, because many of the buccal and lingual inclinations of the teeth will superimpose on the rest of the root structure. Only mesial and distal sharp inclinations can be diagnosed as dilacerations in such radiographs.

Invagination was seen in 1.44% of the cases in this research. Periapical radiography was taken for all patients with this anomaly. Thongudomporn [9] examined 111 orthodontic patients and showed that dental invagination was the most prevalent anomaly whereas the supernumerary teeth and root dilaceration were the least frequent anomaly.

Taurodontism was defined as the presence of an epically displaced pulp chamber without the usual constriction of cemento-enamel junction. In this study, this anomaly accounted for 0.96% of the prevalence. Darwazeh [18] reported a prevalence of 8% taurodontism in Jordanian dental patients. Also, Pillai [3] reported a prevalence of 11.28% of this anomaly among Trinidadian patients. Ezodini in Iran, Yazd [15] found that taurodontism is more prevalent in patients (7.5%). Our results show that taurodontism is uncommon in Shiraz, but further studies are required to assess its prevalence in the

general population. As mentioned previously, abnormal variations in many cases are due to genetic, environmental and pathological factors, or might be a part of systemic or syndromic disorders and should be followed. Recognizing these anomalies will facilitate the endodontic, prosthodontic, periodontic and surgical management of such teeth.

Conclusion

The data from the present study and their comparison with other studies showed that different dental anomalies occur with different frequencies in many countries of the world and even within the same country among different ethnic or regional groups. As with other developmental traits in human beings, these anomalies are under genetic and environmental control, leading to regional differences. While the overall prevalence of each of these anomalies in the dental clinic or population groups may be low, their presence may, in some cases, create a management problem or complicate treatment options for patients. Therefore, their diagnosis and management are important for general patient management.

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