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Dental anomalies seen in adult patients reporting to the orthodontic department of Islamabad Dental Hospital

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Abstract

Introduction: Anomaly means any disorder that strays from standard such as color, number, contour, size and shape of teeth either as a result of local and systemic reasons. It might be existing pre- or post-natal therefore disturbing both deciduous and permanent teeth. Anomalies of this nature have been found in several population groups and hence are considered research worthy for their importance in genetics, forensic odontology and pathology amid other scientific arenas.

Material and methods: In this study 1282 non-syndromic patients were carefully chosen for this cross-sectional study at IDH out of which 60.5% were females and 39.5% were males. Dental defects such as hyperdontia, oligodontia, microdontia, gemination, fusion, concrescence and taurodontism amid others were documented. Data collected was entered and analyzed by the researchers in SPSS version 23.0.

Results: 9.1% presented with dilaceration, 0.5% patients presented with hypodontia, 0.2 % presented with a cusp of Carabelli, 0.5% presented with mulberry molars, 0.2 % had oligodontia, 0.2% had supernumerary teeth, 0.1% had adontia. 0.2% had macrodontia, 0.1 % had microdontia, mesiodens and peg lateral affected 0.1 % and 0.2 % of the patients respectively. Moreover, prevalence of dental anomalies was greater in females 60.5% than in males 39.5%.

Conclusions: It can be deduced from this study that dental defect - dilaceration followed by hypodontia are the most commonly found dental anomalies within patients reporting to Islamabad dental hospital Bharakahu. An additional study with a larger sample will help us improve are findings and understand the existence of dental defects and their possible etiology.

Keywords: Genetic; hypodontia; microdontia; permanent dentition; supernumerary; tooth abnormalities

Introduction

The term anomaly stands for deviation from normal number, shape, color, contour and size of teeth influenced by local and systemic factors before or after birth, hence affecting both deciduous and permanent teeth.[1] These anomalies have been reported in various populations since they are of interest in genetics, forensic odontology and pathology.[2] Deviation from normal number include hyperdontia i.e. excess teeth or supernumerary teeth and hypodontia i.e. absence of one or more teeth, while oligodontia refers to absence of six or more teeth. Aberration in the normal shape include microdontia which refers to teeth smaller in size and macrodontia refers to the teeth larger in size. Other anomalies of shape include dilaceration, gemination, fusion, concrescence, taurodontism and talon cusp.[1]

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Hyperdontia or supernumerary teeth are seen in both deciduous and permanent dentitions.[3] These may be seen in one or both jaws, unilaterally or bilaterally, with mesiodens being the most frequently occurring supernumerary tooth.[3] The crowns and roots of supernumerary teeth present with either different atypical shapes or with a normal appearance and their roots may develop completely or incompletely. These may come with associated complications such as displacement and failure of adjacent teeth to erupt, root resorption, abnormal diastema.[4] Hyperdontia is most commonly found in maxillary lateral incisors, premolars and molars.[5] Hypodontia may have a genetic or a developmental etiology with most supported being the polygenic mode of inheritance theory.[1] The most common of which is the autosomal dominant hypodontia.[6] This condition can be associated with several syndromes and cleft lip and palate.[7] Most frequently missing teeth reported are the mandibular second premolars followed by maxillary laterals. The male to female ratio of hypodontia is 2:3.[8]

Dilaceration has been seen to occur by pressure from adjacent cysts and tumors or by direct trauma to developing teeth. Consequently, a bend develops between the portions of the tooth already formed and the still developing part of the tooth germ.[3,8] It is particularly important to identify a dilaceration prior to orthodontic tooth movement, root canal treatment and extraction. Microdontia refers to the teeth that are smaller in size than the normal.[2] Maxillary laterals and third molars are commonly affected.[1] Prevalence of this condition ranges from 0.8 to 8.4% in various population.[9] Peg laterals are a type of microdontia in which a convergence of the proximal surfaces of the crown towards the incisal edge is seen, due to reduction in mesiodistal diameter.[1] Macrodontia is the term used for teeth that are larger than normal. Generalized macrodontia may be characteristic of a syndrome.[2]

Presence of these anomalies affects the esthetics and other functional aspects of mastication. Also, when present, these anomalies pose difficulties during dental treatment. This study will evaluate a baseline data of anomalies of size, number and shape i.e., the frequency of various dental anomalies in the patients reporting to Islamabad Dental Hospital with the aim of concluding which are the most commonly occurring.

Material and Methods

After obtaining approval from IRB as well as the orthodontic department of IDH, a sample of 1282 was taken for cross sectional study. Data was collected by studying the records in the form of study models or radiographs of patients who reported to the Orthodontic department during a period of six months from January 2010 to June 2019. Out of 1282 patients, 506 were males while 776 were females. Patients with syndromes such as Downs syndrome, Dental anomalies secondary to structure, i.e., hypoplasia secondary to amelogenesis imperfecta, or dental fluorosis as well as patients with already extracted permanent or supernumerary tooth were excluded from the study. Data collected was entered and analyzed by the researchers in SPSS version 23.0.

Results

In this study out of 1282 patients, 60.5% were females and 39.5% were males (pie chart). 7.2% had incomplete records. With respect to dental anomalies; 0.2% of the patients presented with Cusp Of Carabelli, 9.1% presented with dilaceration, 0.5% presented with hypodontia, 14% presented in mixed dentition phase, 0.5% presented with mulberry molars, , 0.2% presented with supernumerary tooth, 0.2% presented with oligodontia, 0.1% presented with adontia, 0.2% presented with macrodontia, 0.1% presented with microdontia, 0.1% presented with mesiodens and 0.2% patients presented with peg lateral- as shown in Table I.

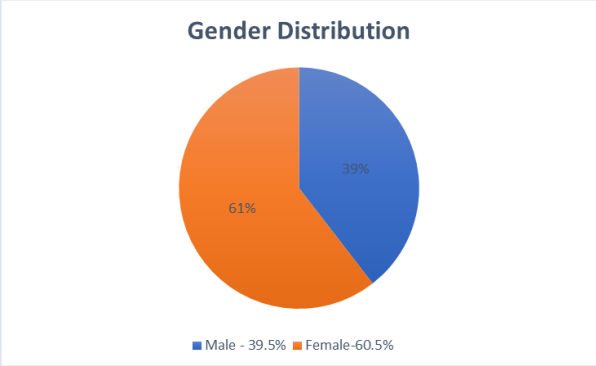

Figure 1: Pie chart showing the gender distribution within sample population

Table I: frequency and percentage of dental anomalies in orthodontic patients

Dental Anomaly	Total number of patients	Frequency	Percentage %
Cusp of Carabelli	1282	3	0.2
Dilaceration	1282	117	9.1
Hypodontia	1282	6	0.5
Mixed Dentition	1282	179	14
Mulberry Molars	1282	7	0.5
Incomplete Records	1282	92	7.2
Oligodontia	1282	2	0.2
Supernumerary teeth	1282	3	0.2
Adontia	1282	1	0.1
Macrodontia	1282	2	0.2
Microdontia	1282	1	0.1
Mesodens	1282	1	0.1
Peg lateral	1282	3	0.2

Discussion

An odontogenic disorder that presents as an increase number of teeth is called supernumerary teeth. Supernumerary teeth are a comparatively common condition of odontogenesis categorized by a surplus number of teeth. It can be found in any section of the dental arch in the deciduous and permanent dentition alike. Related complications are inability of neighboring teeth to erupt, displacement as well as crowding of the adjacent teeth in the affected area, diastema and root resorption.[10] Percentage of patients presenting with supernumerary teeth in our research was 0.2% whereas, in an Australian population, the percentage was 0.28% which was determined after 1050 randomly selected panoramic radiographs were documented as part of a school dental screening New South Wales, Australia in 2014.[11] Supernumerary teeth are frequently discovered by chance as they are impacted and asymptomatic hence OPGs were a preferred diagnostic tool. Mesiodens were the most commonly reported type of super numerary teeth.[11] Though it is noteworthy to mention here that the mean age of the sample group was 10 years. In another retrospective study conducted on Israeli population- a sample of 3000 orthodontically treated patients showed the prevalence of supernumerary teeth as 1.2% with 61% being males and 39% female.[12] In Syrian population a cross-sectional study was carried out using radiographs of 2753 patients and 1.4% of those presented with hyperdontia or supernumerary teeth. Prevalence of supernumerary teeth on the basis of gender 64.1% were males and 35.9% were females.[13] Our results conclude that 60.5% patients were females and 39.5% patients were males in another research, there were 58.6% females and 41.4% males [14] and similar research showed the prevalence as 54% females and 46% males.[15]

Cusp of Carabelli; an accessory cusp found on palatal surface of maxillary first molar[16] had a percentage of 0.2% in our research, whereas research in district of Andhra Pradesh, India showed the percentage as 0.30% [17] and the prevalence in Nigerian population was 17.4%[18].

Dilaceration is a developmental variance in which there is partial or complete curvature of crown or root at the long axis of the tooth. Occasionally seen at the cervical portion or at midway along the root or simply at the root apex; this is based on the degree of injury inflicted upon the root during formation that causes the site of calcified portion of the root to changed and rest of the tooth is molded at an angulation.[19] Periapical radiographs are a reliable diagnostic tool for identifying root dilacerations. An accepted range of angulation is 90 degrees to twenty degrees.[20] In our study the frequency of dilaceration was 9.1% which was similar to another research in Turkish population, where the percentage of

dilaceration was also 9.5%.[20] Contralaterally, in another research, the prevalence was 16.3%.[15] Dilaceration is a result of an unexpected modification in the axial inclination between the tooth crown and the root. The standards in the literature for identifying root dilaceration differ from one researcher to the next.

Hypodontia is the developmental failure resulting in lack of tooth formation.[21] The percentage of patients presenting with hypodontia in our study was 0.5% as compared to what is reported in literature i.e. between 1.6% to 6.9 % depending on the population studied.[22] In an Indian population a sample of 1123 subjects showed the most predominant dental anomaly to be hypodontia, the prevalence was 4.19% while maxillary lateral incisor was the most frequently missing tooth.[23] Oligodontia is a rare congenital absence of six or more teeth. The percentage of patients presenting with oligodontia were 0.20% as compared to another research, which presented it as 0.14% [24] According to a Danish study, the prevalence of oligodontia was reported to be 0.16% in school students. Two out of every three congenitally missing teeth were upper or lower second premolars or upper lateral incisors. [25]

Microdontia is the condition in which affected teeth are smaller in size than normal[21] the percentage of patients presenting with this anomaly was 0.1%, which was similar to research in district of Andhra Pradesh, India where the result was also 0.1%.[17] In a study conducted on Saudi population, radiograph of 1000 patients were analyzed over a period of 4 months for dental defects the prevalence for microdontia anomaly was 0.9%.[26] Macrodontia is the abnormality resulting in affected tooth being larger in size than normal According to the present research, the percentage of people with macrodontia was 0.2%, as compared to another research based in Jazan, Saudi Arabia where a sample 1000 which the percentage of macrodontia was 0.6%.[26] Similarly in a sample of 370 subjects an analysis of OPGs and study models revealed that quarter of patients had at least one anomaly amongst which the prevalence of microdontia was 1.08%.[27]

In Saudi Arabia a sample of 252 children showed that the prevalence of hyperdontia was 3.5% making it the most common defect followed by microdontia with a prevalence of 2.6%.[28] Mesiodens is the supernumerary tooth present between two central incisors. The percentage of mesiodens present in this research was 0.1% whereas the literature suggests a range between 0.09% and 2.05%. [29]

Peg Lateral is an anomaly in which mesiodistal dimension of upper maxillary lateral incisor is small and the tooth is pointed. In Nigeria- a 611 patients' sample was studied; 35 cases of peg lateral were recorded out of which unilateral peg maxillary lateral incisor was prevalent in 21 then bilateral peg 7 with noteworthy predilection for the left side 16(57.1%). Overall, the prevalence of maxillary peg laterals was 4.6%.[30] According to our research, the percentage was 0.2% whereas in other researches, the percentage were 1.8% in sample size of 3337 patients, with maxillary permanent lateral incisor being the most commonly involved tooth [31] and 1.72% in a sample of 3,834.[32]

Adontia is the congenital absence of all teeth.[33] According to the present study, 0.1% patients reported with this dental defect. The scientific literature greatly lacks in stats with respect to adontia. Scientific literature proposes a general range of incidence from 1.6% to 9.6%. It is commonly known to occur in younger children and may be associated with ectodermal dysplasia.[34] In patients who have most or all of their dentition missing, phonetics and mastication usually suffer, moreover it influences their quality of life and mental health. In such cases restorative and prosthetic options are helpful.[35]

Conclusions

In conclusion we can say that patient population reporting to Islamabad Dental Hospital showed the highest frequency of dilacerations followed by hypodontia. Further research is recommended with a larger sample size and more diverse population. An additional study with a larger sample will help us improve are findings and understand the existence of dental defects and their possible etiology. Most dental defects can cause substantial chair side complications and may hamper the treatment plans of even the most capable dental practitioners. Timely identification of dental anomalies can offer ideal management for the patient by intervening at an early age. Noticing a developmental disorder early reduces complications in future and improves the quality of life.

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