CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3386684

Available online at: http://www.iajps.com *Research Article*

A CROSS-SECTIONAL RESEARCH TO DETERMINE THE PREVALENCE PATTERN OF ORTHODONTIC RELATED ANOMALIES LEADING TO SERIOUS ORTHODONTIC PROBLEMS

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Article Received: July 2019 **Accepted:** August 2019 **Published:** September 2019

Abstract:
Background: *Dental anomalies do exist as evidence of various dental problems and abnormalities leading to severe issues related to orthodontic health. These anomalies require proper treatment and planned follow-up as well. There is a crucial role of radiological and clinical investigations for the identification and diagnosis of various orthodontic anomalies.*
Objective: *The objective of this research was to determine the distribution pattern of various morphological anomalies reported among orthodontic patients.*
Patients & Methods: *We carried out this cross-sectional research in the course of one year (March 2018 to February 2019) at Sir Ganga Ram Hospital, Lahore. The patients were documented for their family history, medical history and dental history along with intraoral assessment, dental and cast radiographic assessment which caused the disturbance related to location, form, size and number of teeth. We did not include any patient having syndromes.*
Results: *We reported orthodontic anomalies among 16% patients (83) in a total of 520 patients. Majority of the patients 37 (7.10%) were reported for Hypodontia; whereas, mostly missing tooth was maxillary lateral incisor. Next repeated anomaly was Microdontia which was presented among 21 patients (4%) with the same missing tooth. The rare onset of double tooth loss was reported as only one patient (0.19%) was found with double tooth loss. Females were more prone to these anomalies than males except for transposition and double tooth loss. These both anomalies were mostly reported among males than females.*
Conclusion: *Occlusion disturbance may occur due to various dental anomalies. The responsibility lies on the shoulders of Orthodontists for careful observation and possessing sound professional knowledge that can help in the treatment of various related anomalies with proper planning and treatment modalities with reduced complications and increased rate of success.*

Keywords: *Supernumerary, Hypodontia, Taurodontism, Dental Anomaly and Double Tooth.*

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Please cite this article in press Somaya Imran et al., ***A Cross-Sectional Research to Determine the Prevalence Pattern Of Orthodontic Related Anomalies Leading To Serious Orthodontic Problems,*** *Indo Am. J. P. Sci, 2019; 06(09).*

INTRODUCTION:

Healthcare is greatly relying on the better understanding of dentofacial genetics for treatment planning and disease diagnosis [1]. Dental deformities can bring issues related to mandibular and maxillary arches. It can affect and complicate occlusion and orthodontic treatment [2]. Aetiology of dental anomalies is dependent on environmental and genetic factors [3]. The complex interplay in the course of tooth formation can cause various related anomalies due to environmental and genetic factors [4]. Clinical and radiographic assessments are important to diagnose and treat dental anomalies. A comprehensive assessment can be helpful to prevent dental issues like malocclusion, periodontitis and carries [3]. Professionals have doubts regarding dental anomalies and concerns over the effect of dental anomalies on malocclusion [5 – 8]. Previous studies have already established the presence of dental anomalies among orthodontic patients [2, 9]. Variation in the studies can be attributed to different factors like sample size, racial variations, study period and data collection procedure [10].

Dental anomalies do exist as evidence of various dental problems and abnormalities leading to severe issues related to orthodontic health. These anomalies require proper treatment and planned follow-up as well. There is a crucial role of radiological and clinical investigations for the identification and diagnosis of various orthodontic anomalies. The objective of this research was to determine the distribution pattern of various morphological anomalies reported among orthodontic patients.

METHODOLOGY:

We carried out this cross-sectional research in the course of one year (March 2018 to February 2019) at Sir Ganga Ram Hospital, Lahore. The patients were documented for their family history, medical history and dental history along with intraoral assessment, dental and cast radiographic assessment which caused the disturbance related to location, form, size and number of teeth. We did not include any patient having syndromes. We did not include all those patients who have experienced permanent tooth extraction, congenital anomalies, received orthodontic treatment, palate, cleft lip, syndrome or metabolic disorder. Patients were documented for demographic detail. They also underwent detailed intraoral assessment and panoramic dental radiograph to identify possible dental anomalies. We assessed dental anomalies like teeth number disturbance (Hyperdontia and Hypodontia), disturbance in teeth size (Microdontia and Macrodontia), disturbance of teeth form (Double tooth and Taurodontism) and disturbance of teeth location (Transposition). A single investigator recorded all the information for reliability. Statistical analysis was made on SPSS software.

RESULTS:

We reported orthodontic anomalies among 16% patients (83) in a total of 520 patients. Majority of the patients 37 (7.10%) were reported for Hypodontia; whereas, mostly missing tooth was maxillary lateral incisor. Next repeated anomaly was Microdontia which was presented among 21 patients (4%) with the same missing tooth. The rare onset of double tooth loss was reported as only one patient (0.19%) was found with double tooth loss. Females were more prone to these anomalies than males except for transposition and double tooth loss. These both anomalies were mostly reported among males than females.

Detailed outcomes about the status of anomalies, distribution of anomalies and gender versus dental anomalies have been presented in the given tabular data:

Table – I: Status of Anomalies

Anomalies	Percentage
No Anomaly	84
Dental Anomaly	16

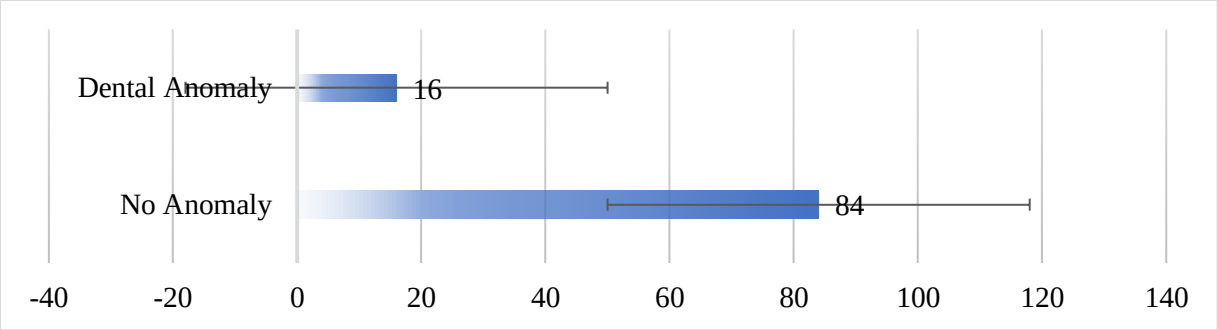


Table – II: Distribution of Anomalies

Anomalies Distribution	Percentage
Transposition	0.38
Double Tooth	0.19
Taurodontism	0.5
Microdontia	4
Macrodontia	2.1
Hyperdontia	1.5
Hypodontia	7.1

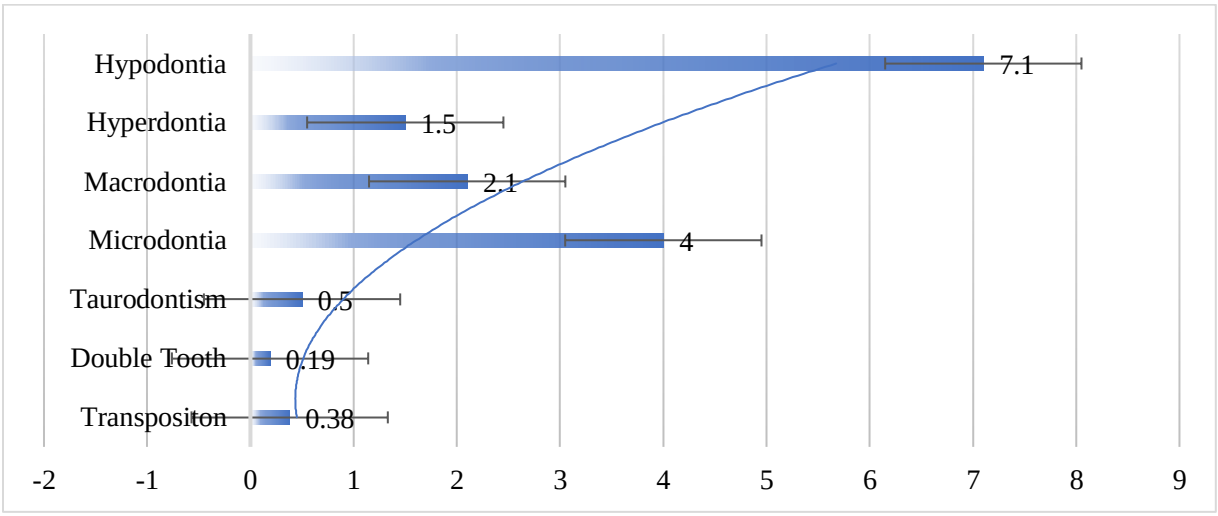
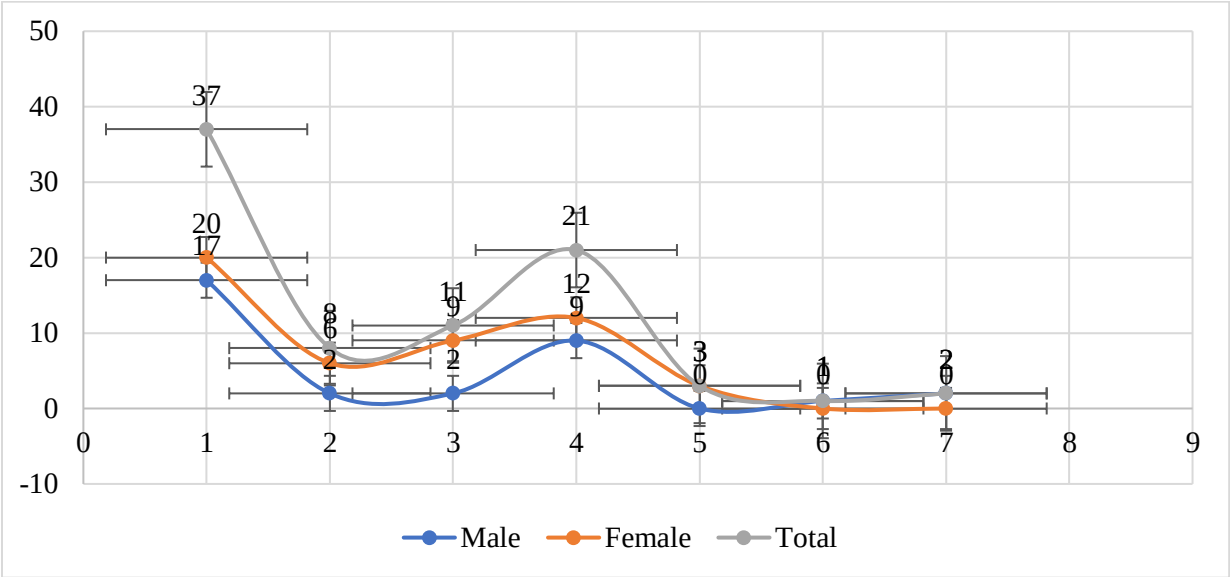


Table – III: Gender Versus Dental Anomalies

Gender/ Dental Anomalies	Male	Female	Total
Hypodontia	17	20	37
Hyperdontia	2	6	8
Macrodontia	2	9	11
Microdontia	9	12	21
Taurodontism	0	3	3
Double Tooth	1	0	1
Transposition	2	0	2



DISCUSSION:

We reported dental anomalies among 16% patients with most involvement of Hypodontia which was reported in 37 patients (7.1%). Rathi reported dental anomalies among 12.9% patients with the most prevalent anomaly as Hypodontia [11]. Congenitally missing tooth refers to those teeth where there is no development of germs which can differentiate the dental tissues [12]. Hypodontia aetiology is developmental in nature but Moyer proposed five known causes of the absence of congenital teeth such as Syphilis, Rickets, Ectodermal Dysplasia and Heredity [13]. Repeatedly missing congenital teeth were mandibular second premolars, maxillary second premolars and maxillary lateral incisors after third premolar [14 – 20]. These outcomes are similar to the outcomes reported in another research [21]. Bolk theory presents that in case of one to fourth missing teeth mostly absent tooth is a distal tooth that is second premolar, lateral incisor and third molars [22]. A multidisciplinary approach is required to treat Hypodontia that includes prosthetic replacement and orthodontic corrections [10]. Geographic differences cause a wide range of prevalence of values among patients such as various authors reported Hypodontia 8.1%, 8.5% and 2.7% in their research studies [22 – 24]. Permanent teeth Hypodontia varies from (1.6% – 9.6%) in different populations [25 – 28].

Second most repeated onset was reported about Microdontia which was reported in 21 patients (4%). It ranges from (0.8% – 8.4%) among various populations specially among females [29]. The greatest variability in size has been reported mostly in the distal tooth which is also commonly congenitally missing tooth [30]. We did not include third molars in our research; the most affected teeth were maxillary lateral incisors which is also reported by various international studies [29 – 30]. Authors have also associated the canine palatal displacement with small size lateral incisors [31 – 32].

Microdontia was more prevalent than Macrodontia [9]. Macrodontia is reported among those patients who suffer from pineal hyperplasia and pituitary gigantism [33]. Only one case was reported about Macrodontia (2.1%) in our series. The most affected tooth was Maxillary central incisor which is also reported in other studies as well [34].

Hyperdontia refers to an extra tooth to the normal array of teeth which may lead to an ectopic or delayed eruption and it can also change the overall appearance [12]. Appropriate treatment requires an early diagnosis which can reduce the chances of related complications [35]. More prevalence of supernumerary has been reported among males within the range of (0.1% – 3.8%) [36]. Hyperdontia is mostly found in the anterior maxillary area [37].

Taurodontism presents extended pulp chambers which have increased apicoocclusal height and lack in constriction at the level of cementoenamel junction [38]. There is a wide variation in the shape and size of the pulp chamber that makes the treatment process more challenging. It also affects permanent teeth more than the primary ones in (5.67% – 60%) patients [39 – 40]. We reported its prevalence among 0.5% of patients.

Another rate eruption is teeth transposition which involves an incidence of (0.3% – 0.4%) in permanent dentition [41, 42]. Transposition is mostly reported in the first premolars and maxillary canines [43, 44]. We reported transposition among 2 patients (0.38%) which has also been reported by various other authors as well [10, 43 – 44]. It can also occur in various other anomalies such as deciduous teeth retention and peg laterals [41]. Esthetics is mostly affected by double tooth and it can also lead to the eruption of adjacent teeth and crowding. Treatment plan completes with orthodontic interventions. The possible reasons behind the double tooth are gemination or fusion. Fusion may also present partial or total dentin union and pulp [45].

CONCLUSION:

Dental anomalies do exist as evidence of various dental problems and abnormalities leading to severe issues related to orthodontic health. These anomalies require proper treatment and planned follow-up as well. There is a crucial role of radiological and clinical investigations for the identification and diagnosis of various orthodontic anomalies. The objective of this research was to determine the distribution pattern of various morphological anomalies reported among orthodontic patients. Occlusion disturbance may occur due to various dental anomalies. The responsibility lies on the shoulders of Orthodontists for careful observation and possessing sound professional knowledge that can help in the treatment of various related anomalies with proper planning and treatment modalities with reduced complications and increased rate of success.

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