

ORIGINAL ARTICLE**CORRELATION OF DENTAL ANOMALIES WITH DIFFERENT TYPES OF MALOCCLUSIONS IN ORTHODONTIC CLINICS**Sakshi Bamba¹, Akshay Gupta², Anur Gupta³, Veronika Dogra⁴, S. Vikram⁵, Chitra Anandani⁶

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ABSTRACT:

Objective: The study was conducted to associate the prevalence of dental anomalies with Angle's classification of malocclusion. **Methods:** The total sample of the study was 361 of which 198 were boys and 163 were girls. The sample was examined for different teeth abnormalities and these were further linked with Angle's classification of malocclusion (Class I, Class II and Class III). Data analysis was performed using SPSS statistical software for Windows v.15.0. The level of significance was set at p value < 0.05. **Results:** The most frequently noticed malformation was rotation of teeth (32.7%) followed by impaction (29.8%) and hypodontia (8.4%). Angle's Class III malocclusion cases showed highest mean of dental anomalies (2.03±1.515), followed by Class II (1.46±1.052) and Class I (0.40±0.829). **Conclusions:** The frequency of dental anomalies was quite high and it was positively associated with Class II & III type of malocclusion. Careful diagnosis would abridge the treatment plan and trim down its complications.

Keywords: Dental anomalies; Malocclusion; Orthodontics

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INTRODUCTION

Craniofacial and occlusal relationships have been used over the years to describe and categorize malocclusions. Congenital anomalies of the teeth, such as hypodontia, impactions, and trans-positions, often appear together with craniofacial discrepancies generating complicated therapeutic problems.¹

Dental anomalies can be defined as the malformations present in relation to the teeth. It may be due to aberrant dimension, number, shape, size and eruption pattern. Dental anomalies have diverse etiologies such as hyperactivity of the dental lamina, atavism, and conception of multifactorial inheritance, to name a few. Although a variety of dental anomalies are often observed, yet the most common are the missing teeth seen as: hypodontia, oligodontia and anodontia.²

The occurrence of developmental dental anomalies is frequently observed in orthodontic patients as these anomalies play a vital role in the etiology of malocclusion. Dental anomalies among orthodontic patients are comparatively higher than general population. Such anomalies in tooth shape, size, number or structure can cause discrepancies in maxillary and mandibular arch length and occlusion disturbances, ultimately complicating the orthodontic management.³

Many studies have shown the association of dental anomalies with certain orofacial characteristics. Endo et al⁴ observed the relationship of craniofacial morphology with hypodontia in a group of Japanese orthodontic patients. It has also been reported that patients with malocclusion had more number of missing and supernumerary teeth.⁵ The causes of dental anomalies are largely unidentified, but reported text also showed a possible link of genetic factor between malocclusions and dental anomalies.^{6,7}

Researchers also noticed the relationship between the mandibular and maxillary mesiodistal tooth size with Angle's Class I, II, and III malocclusions. Similarly Akyalc et al noticed a significant relationship between the Bolton ratio and the overjet.⁸

Upon literature review, very few researches were found in the northern part of India in this domain. Hence, the present study was carried out to examine the relationship between Angle's types of malocclusion and tooth anomalies.

MATERIAL & METHODS

This study was conducted among the patients coming to orthodontic clinics for the correction of malocclusion from January to May 2016. A total of fifty clinics, where orthodontic procedures were carried out, were visited on a regular basis. Patients having any sort of medical complication such as ectodermal dysplasia, Down's syndrome, cleft lip and cleft palate were excluded. Patients in between the age group of 10 to 17 years were included. An informed consent was obtained from each patient prior to the examination of their oral cavity.

The total sample of the study consisted of 361 patients, including 198 boys and 163 girls. The sample was further categorized according to Angle's classification (based on the relationship between first permanent maxillary and mandibular molar) i.e. the anterior-posterior dental arch relationship.⁹ Different types of malocclusion were observed among patients

such as Class I (203 patients), Class II (120 patients) and Class III (38 patients).

The inter-examiner variability and credibility of the survey was assessed with a pilot study among 30 school children. The data gathered during this pilot survey was not included in the main study.

Diagnosis of dental anomalies for the subjects was done on the basis of clinical signs and symptoms, cephalometric readings, radiographs and examination of dental casts. Those who were found with any of the abnormality such as: macrodontia, microdontia, hypodontia, dilaceration, fusion, supernumerary teeth, peg shaped lateral incisor, taurodontism, rotation, ectopic eruption and impaction were isolated and their association with the malocclusion was developed.

Data analysis was performed using SPSS statistical software for Windows v.15.0 (SPSS Inc., Chicago, IL, USA). Parametric test was used to obtain mean values. The level of significance was set at p value < 0.05.

RESULTS

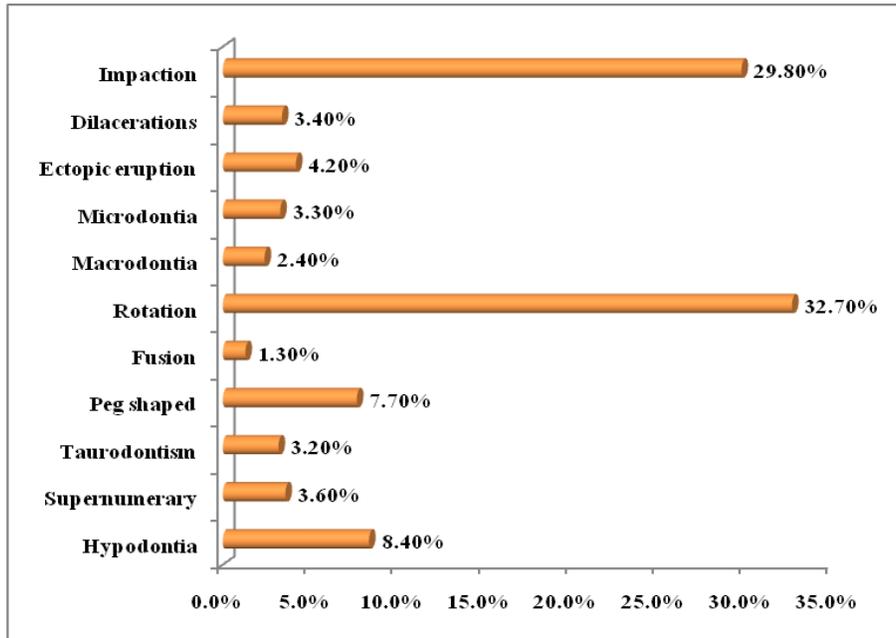
The data accessed the frequency of dental anomalies and its relationship to malocclusion. Among the various anomalies observed, the most recurrent one was rotation of teeth (32.7%) followed by impaction (29.8%) and hypodontia (8.4%). Other teeth anomalies such as dilacerations, microdontia, macrodontia, fusion, taurodontism and supernumerary teeth were showing prevalence of less than 4% (Graph 1).

Further it was noticed that the occurrence of a single anomaly was seen in 33.2% of the subjects, 8.9% were found with two different anomalies, and very few subjects were observed with 5 - 6 anomalies. The study also illustrated significant difference of anomalies among boys and girls (Graph 2).

Angle Class III malocclusion cases showed highest mean of dental anomalies (2.03 ± 1.515), followed by Class II (1.46 ± 1.052) and Class I (0.40 ± 0.829). The difference in all the cases of malocclusion was statistically significant (p value ≤ 0.05) as illustrated in Table 1.

However, the study reported non-significant results according to age, in which 12 to 13 year group had highest anomalies (0.96 ± 1.140) and 16 to 17 year has least (0.90 ± 1.129) (Table 2).

Graph 1: Graph showing different types of dental anomalies among study subjects



Graph2: Graph showing dental anomalies seen in relation to gender

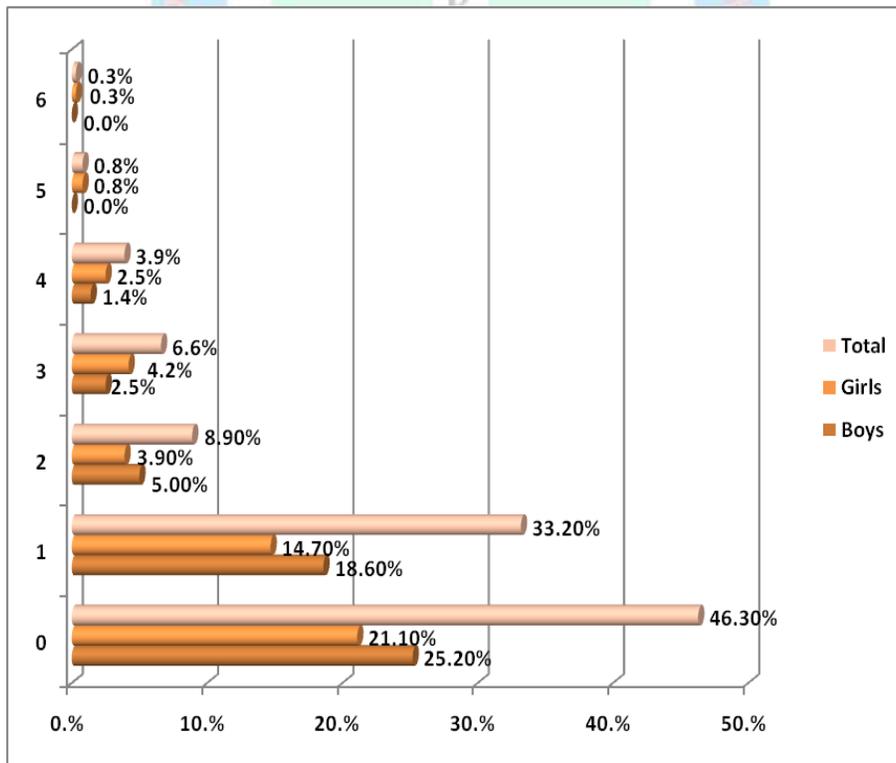


Table 1: Table showing mean of dental anomalies in association with Angle's classification of malocclusion

Angle's Classification	No	Mean	SD	F-value	Sig.
Class I	203	.40	.829	68.682	.000
Class II	120	1.46	1.052	85.371	.000
Class III	38	2.03	1.515	133.598	.000
Total	361	.92	1.169		

Table 2: Table showing mean of dental anomalies according to age groups

Age	No	Mean	SD	F-value	Sig.
10-11 years	69	.93	1.075	.039	.990
12-13 years	74	.96	1.140	.050	.824
14-15 years	119	.92	1.279	.058	.809
16-17 years	99	.90	1.129	.030	.971
Total	361	.92	1.169		

DISCUSSION

Dental anomalies can be caused by a multitude of things including genetics or by just one small variation in the environment.¹⁰ The present study focuses on the correlation between different tooth anomalies and Angle's malocclusion and other demographic characteristics as very limited articles are published related to this till date.¹¹⁻¹⁴

Rotation and impaction were the most common findings observed by the authors in this study. This was in contrast to the results of Ezoddini et al in 2007¹⁵ wherein the occurrence of impaction was 8.4% and Gupta et al who found prevalence of 3.74% impacted teeth in non-orthodontic patients (excluding third molars).⁷ Another study by Afify and Zawawi found impaction in 21.1% in non-orthodontic patients.¹⁶ The findings of the present study was higher which may be due to the inclusion of third molars where as other studies excluded it.

The frequency of hypodontia was 8.4% and comparable results were obtained by Uslu et al in their study.¹² However other studies showed higher prevalence of hypodontia ranging from 11.1% in Korean¹⁷ to 26.4% in Thai populace.¹⁸ Similarly the prevalence of supernumerary teeth was comparatively higher than other studies conducted by Legovic et al (1990)¹⁹ and Alberti et al (2006).²⁰

The percentage of peg shaped lateral incisors was 7.7% in the current data and previous findings

reported its frequency as 0.3 and 8.4% among random population studies (Brin et al in 1986;²¹ Ooshima et al in 1996).²² The prevalence of subjects with ectopic eruption in this study was 4.2% which is significantly lower than the frequency of Kotsomitis et al study who reported it as 29.7%.²³

Fusion and gemination in the non orthodontic patients was reportedly low (0.19%) according to the results of Altug-Atac study.¹⁴ Similarly, the present study illustrates parallel results of fusion whereas no case of germination was observed by the examiners.

Moreover the scores of teeth anomalies was more in patients examined with Angle's Class III and Class II malocclusion, while a small number of participants with Class I malocclusion had anomalies. Correspondingly, Basdra et al (2001) mentioned anomalies are positively linked with Class II malocclusion in German individuals.¹ Based on this finding, it can be inferred that there is presence of a common genetic factor that influences between skeletal growth and malocclusion.⁹

The occurrence of only one malformation of teeth was seen in 33.2% patients and fewer numbers of patients had two or more malformations. This was in accordance to the study of Sogra et al who observed that 12% subjects showed at least one dental anomaly and 5% subjects showed more than one anomaly.³

CONCLUSION

The results of the present study substantiate that a higher prevalence of dental malformations were positively associated with Class II & III type of malocclusion. Most commonly noticed anomalies were rotation of teeth and impaction. Henceforth, dental professionals, specifically orthodontists, should detect them prudently so as to simplify their treatment plan and alleviate the future complications.

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