

# ASSOCIATION OF DENTAL ANOMALIES WITH DIFFERENT MALOCCLUSIONS IN PATIENTS VISITING LIAQUAT COLLEGE OF MEDICINE & DENTISTRY

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## ABSTRACT

*The purpose of present study was to determine association of dental anomalies observed in various dental malocclusion patients visiting for Orthodontic treatment. Total of 600 patients (169 male, 431 female) having mean age 17.25±5.55 years were evaluated.*

*This study showed that 61.2% of patients (n = 600) presented with at least one dental anomaly. Ectopic eruption was the most commonly found (46.8%), followed by Agenesis (missing tooth or teeth) 9.0%, canine impaction 4.0% and supernumerary teeth 1.3%. The frequency of these dental anomalies were found higher in female than in males. Ectopic eruption (56% within malocclusions) was more frequent in patients with Class II div 1 malocclusion. No supernumerary tooth was found in Class II division 2 malocclusion rather more prevalent in class III malocclusion (2.5%). Impaction was associated with Class II div 2 malocclusion (11.1%), at a higher prevalence than other types of malocclusions. Agenesis was associated with Class II div 2 malocclusion and class III malocclusion (14.8). The correlations between dental anomalies and different types of malocclusion were found statistically significant.*

*Within limitation of this study, Dental anomalies recorded frequently higher in females than male subjects, the reason may be the female patients being more esthetically conscious, visiting orthodontic treatment in Pakistan.*

**Key Words:** Association. Anomalies, Orthodontics, Malocclusion.

## INTRODUCTION

Dental anomalies are caused by multifactorial, multilevel, multidimensional process and occurs during the histo-differentiation or morpho-differentiation stages of tooth development. This process is complicated interactions between environmental factors, epigenetic and genetic during the process of tooth development.<sup>1</sup> Clinical orthodontists pay key attention to know the associations between dental anomalies in their patients. A number of authors have recently focused

to increased awareness of relationships among tooth abnormalities.<sup>2</sup> Although these dental anomalies often seen with different presentation in various ethnic and racial groups, yet a few studies contributed regarding the issues in orthodontic patients. In previous studies, Uslu et al<sup>3</sup> showed that tooth agenesis was the most commonly found dental anomaly in orthodontic patients. Most commonly missing teeth were the wisdom teeth followed by mandibular 2nd premolars and then maxillary lateral incisors.<sup>4</sup> Supernumerary teeth are another commonly seen dental anomaly. These are the extra teeth that occur in addition to the normal series and may arise due to dichotomy of a tooth bud; however the most acceptable cause is localized independent hyperactivity of the dental lamina.<sup>5</sup>

Tooth Impaction is the disturbance of eruption caused by some local factors (persistent primary teeth, lack of space, or benign tumors, odontomas and cysts,) or any other physical barrier in their path.<sup>6</sup> While Ectopia or ectopic eruption occurred due to the disturbances in the path of eruption and the tooth abstained from the actual path of eruption.<sup>7</sup> Recent advances in molecular genetics have established the importance of different mutations in two transcription factors i.e. PAX9 and MSX1, in dental development pahse.<sup>8</sup>

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These anomalies can be observed on panoramic radiographs which are one of the commonly requested during radiographic examinations. Orthodontists frequently use these radiographs to diagnose malocclusion, plan treatment and assess progress and achievement of treatment goals. An orthodontist, during diagnosis and treatment planning phase should know about the potential presence of relevant pathology in their patients and can expect to discover anomalies on radiographs.<sup>13</sup>

Higher rate of dental anomalies were found in Orthodontic patients if not early detected that can compromise restorative and orthodontic treatment. Therefore, the purpose of this study was to investigate the frequency of dental anomalies like agenesis, impacted teeth, supernumerary teeth and ectopic eruption and determine their association with different types of malocclusion.

## METHODOLOGY

A cross sectional study was conducted at the Orthodontic department of Liaquat College of Medicine & Dentistry, Dar-ul-Sehat Hospital, Karachi, Pakistan. Data were collected from the patient's diagnostic records who reported at the department for orthodontic treatment from October 2014 to February 2017.

Diagnostic records of 600 patients (169 male, 431 female) were evaluated. These patients were examined by Orthodontist and Residents of Orthodontic department. The patients with age range 11-22 years, no history of previous permanent tooth extraction and non contributory medical history were included in the study. Patients with impacted third molars, syndromes

or dental trauma before orthodontic treatment were came under exclusion criteria.

Dental anomalies (Agenesis, supernumerary teeth, ectopic eruption, Impaction) were investigated from pretreatment diagnostic records. Malocclusion was classified on the basis of evaluation of intraoral photographs, dental casts and cephalometric data into four groups: Class I, Class II, division 1- Class II, division 2 and Class III.

Data was analyzed by SPSS (version 20) for descriptive statistics for frequencies and graphs. Statistical analyses were done using chi-square test, keeping a significance level of 5% for associations between variables if any. p-value <0.05 were considered significant.

## RESULTS

Total of 600 patients 367 (61.2%) were present with at least one dental anomaly, with 262 of them being females (71.3%) and 105 being males (28.6%). The age range found was 11-22 years with mean age  $17.25 \pm 5.55$  years and 233 (38.8%) had no anomalies. Ectopic eruption was the most common (46.8%), followed by Agenesis (missing tooth or teeth) 9.0%, impaction 4.0% (canine) and supernumerary teeth 1.3% as shown in Table 1. The correlations between dental anomalies and different types of malocclusion were found statistically significant. The rates of dental anomalies were found higher in female than in males as shown in Table 2.

## DISCUSSION

A 61.2% of the total subjects presented with at least one dental anomaly which was more prevalence

TABLE 1: DISTRIBUTION DENTAL ANOMALIES IN DIFFERENT MALOCCLUSIONS

			Anomalies					Total
			Agen- esis	Supernumer- ary Teeth	Ectopic Eruption	Impac- tion	No Anoma- lies	
Malocclu- sion	Class I	Count	24	5	105	11	104	249
		% within Malocclusion	9.6%	2.0%	42.2%	4.4%	41.8%	100.0%
	Class I Div 1	Count	14	1	136	6	86	243
		% within Malocclusion	5.8%	.4%	56.0%	2.5%	35.4%	100.0%
	Class II Div 2	Count	4	0	12	3	8	27
		% within Malocclusion	14.8%	.0%	44.4%	11.1%	29.6%	100.0%
	Class III	Count	12	2	28	4	35	81
		% within Malocclusion	14.8%	2.5%	34.6%	4.9%	43.2%	100.0%
	Total	Count	54	8	281	24	233	600
		% within Malocclusion	9.0%	1.3%	46.8%	4.0%	38.8%	100.0%

TABLE 2: GENDER DISTRIBUTION OF DENTAL ANOMALIES

		Anomalies					Total
		Agenesis	Supernumerary Teeth	Ectopic Eruption	Impaction	No Anomalies	
Gender	Male	11	3	81	10	64	169
	Female	43	5	200	14	169	431
Total		54	8	281	24	233	600

in female than male, the result of our study was found similar to the results found by other authors.<sup>3,14</sup> Thongudomporn<sup>15</sup> determined a higher rate of 74.78% in a study of 111 orthodontic patients and concluded that the orthodontic patient have more tendency to develop dental anomalies than the general population which was found to be higher than previous studies. However, they did not determine association in orthodontic malocclusions as being observed in present study.

Moreover, the dental anomalies associated with Class II, division 2 malocclusion<sup>9</sup>, indicating a strong genetic link in the development of this type of malocclusion.<sup>10</sup> Class II, division 1 and Class III malocclusions showed a pattern of occurrence of dental anomalies similar to that present in the general population. Impaction was more frequently found in Class I and Class III malocclusions found in Turkish patients<sup>3</sup>; while no anomalies were associated with Class III and Class II division 1 malocclusions in German patients.<sup>11</sup>

As for as the observed anomalies (agenesis, impaction, ectopic eruption and supernumerary teeth) were concerned, our results were similar to previous study by Kazanci et al<sup>16</sup>, in which ectopic eruption was found the most frequent anomaly in patients with Class II div 1 malocclusion. But, the literature review had dissimilar results<sup>3,11,14,17</sup>, as evaluated in the different populations studied.

Tooth agenesis present with a clinical challenge for management as being the most clearly recognized developmental dental anomaly in human population. The prevalence dental agenesis had conflicting results among different racial populations. Permanent dentition were affected more frequently than the primary dentition by tooth agenesis.<sup>18</sup> Tooth agenesis, were found in 9.0% of this study sample associated with Class II div 2 malocclusion and 14.8% in class III malocclusion. However, agenesis, microdontia and tooth impaction have been associated with Class II division 1 in Portuguese patients, showing correlation with retroclination of four or more maxillary anterior teeth.<sup>12</sup>

According to Uslu et al<sup>3</sup> the maxillary anterior region being more prevalent for ectopic eruption in 0.6% and supernumerary teeth 0.3% of the total study sample.

Lind<sup>19</sup> reported that supernumerary teeth were found to be 3.6% of total 1717 Swedish orthodontic patients while our study found that supernumerary teeth were 1.3%, associated with Class III of the total study samples. Kotsomitris et al<sup>20</sup> found a 29.4% prevalence of ectopic eruption and our study had higher number i.e. ectopic eruption in 46.8% of total study sample associated with Class II div 1.

According to the previous studies, impacted maxillary permanent canines found in 1% to 3% of the studied population.<sup>9,21</sup> Basdra et al<sup>11</sup> determined a higher rate of impacted maxillary canines (33.5%) in 267 study subjects with Class II Division 2 malocclusion. In the present study 4% of impaction canines were found, among them (11.1%) were associated class II Division 2 malocclusion.

Our study results reported that not a single supernumerary tooth anomaly was associated with Class II division 2 malocclusion, which was not in line with the results of Basdra et al<sup>9</sup> and Pereira<sup>14</sup>, who showed a strong the association of several dental anomalies with Class II div 2 malocclusion in German and Portuguese patients, respectively.

Basdra et al<sup>11</sup> reported no statistically significant differences between dental anomalies and different type of malocclusion. They studied only 83 patients showing anomalies with Class III or Class II division 1 malocclusions, while 600 patients evaluated in the our study. Correlations between dental anomalies and different types of malocclusion were found statistically significant.

## CONCLUSION

Most of orthodontic patients presented with at least single dental anomaly (61.2%) in the present study. Significantly higher rate of dental anomalies were found in orthodontic patients. Dental anomalies were recorded higher frequency in females, because of the higher number of female patient visiting orthodontic treatment. The difference in prevalence compared with previous studies might arise from racial differences or differences in diagnostic criteria. Within the limitation of the study, more research areas regarding dental anomalies in orthodontic patients need to be investigated using latest diagnostic tool in future.

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## CONTRIBUTIONS BY AUTHORS

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| <b>1 Rabia Shafique:</b>           | Concept, paper writing.                       |
| <b>2 Attiya Shaikh:</b>            | Supervision.                                  |
| <b>3 Muhammad Amjad:</b>           | Statistical analysis, interpretation of data. |
| <b>4 Muhammad Abdullah Kamran:</b> | Proof reading.                                |
| <b>5 Ayesha Farooq Khan:</b>       | Data collection.                              |
| <b>6 Kehkashan Yonus</b>           | Data Collection.                              |