

FREQUENCY OF DENTAL ANOMALIES IN VARIOUS MALOCCLUSIONS IN ORTHODONTIC PATIENTS

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ABSTRACT

The aim of this study was to determine the frequency of different dental anomalies in different malocclusion groups of patients seeking orthodontic treatment. This study was carried out at the Orthodontic Department of Armed Forces Institute of Dentistry (AFID), Rawalpindi. Data for the study were collected from the pretreatment diagnostic records of patients who reported at the department for orthodontic treatment from June 2003 to June 2009. A total of 503 patients of both gender (158 male, 345 female) with mean age 15.89 ± 3.03 years (range, 11-22 years) were evaluated for study. All the subjects were in permanent dentition and had pretreatment diagnostic records were included in the study. Patients with syndromes, severe medical histories, impacted third molars, extraction of any permanent tooth, or trauma to any tooth before orthodontic treatment were excluded from the study.

It was found that 55.3% of patients (n =503) had at least one dental anomaly. Agenesis (missing tooth or teeth) was the most common (24.9%), followed by ectopic eruption 21.3%, impaction 7.8% (canine) and supernumerary teeth 1.4%. The rate of tooth agenesis was higher in female than in males. No statistically significant correlations were found between dental anomaly and type of malocclusion.

A remarkably high rate of dental anomalies was recorded. Dental anomalies reflected higher frequency in females, presumably because of the higher number of female gender seeking orthodontic treatment in Pakistan.

Key words: Anomalies, Malocclusion, Prevalence

INTRODUCTION

Dental anomalies can result from many factors both genetic and environmental. Although defects in certain genes are the most influential etiological events in the prenatal and postnatal periods have also been blamed for anomalies in tooth dimension, morphology, position, number and structure.¹

These anomalies often present in various racial and ethnic groups, Only a few studies described the issue in relation to orthodontic patients. Uslu et al.¹ showed that agenesis was the most common anomaly in orthodontic patients.

Several studies gave percentages of various dental anomalies in various populations, but their results are conflicting. The discrepancies in their results were attributed to racial differences, variable sampling techniques, and different diagnostic criteria. The only common point of these studies was the unavoidable frequency of developmental dental anomalies in every community.²

Orthodontic patients has high rate of dental anomalies that can complicate dental and orthodontic treatment, if not early detected. Therefore, their presence should be carefully investigated during orthodontic

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diagnosis and considered during treatment planning. Because of distinct characteristics of each malocclusion, we aimed to investigate the frequency of most common dental anomalies in a group of orthodontic patients and to derive admonitory clinical suggestions.

METHODOLOGY

The present study was carried out at the Orthodontic department of Armed Forces Institute of Dentistry, Rawalpindi. Data for the study were collected from the pretreatment diagnostic records of patients who reported at the department for orthodontic treatment from June 2003 to June 2009.

Pretreatment diagnostic records, panoramic and periapical radiographs, dental casts, intraoral photographs, and dental histories of 503 patients (158 male, 345 female) were evaluated for the study. All the patients were examined by orthodontists and residents of orthodontic department. The mean age of patients was 15.89 ± 3.03 years (range, 11-22 years). All the subjects were in permanent dentition and their pretreatment diagnostic records were included in the study. Patients with syndromes, severe medical histories, impacted third molars, extraction of any permanent tooth, or trauma to any tooth before orthodontic treatment were excluded from the study.

The following most common dental anomalies were investigated;

Agenesis (a congenital absence of a permanent tooth or germ), supernumerary teeth (teeth that appear in addition to the regular number of teeth), ectopic eruption (eruption of a tooth in an abnormal position), Impaction (a tooth that is not expected to erupt completely into its normal functional position based on clinical and radiographic assessment). All statistical calculations were done using SPSS version 17.

RESULTS

A total of 278 subjects (55.3%) had at least one dental anomaly, and 225 (44.7%) had no anomalies. Figure 1 illustrates the number of subjects with at least one dental anomaly in each malocclusion group.

The most prevalent dental anomaly was tooth agenesis, observed in 24.9% of the sample followed by ectopic eruption 21.3%, impaction 7.8% (canine) and supernumerary teeth 1.4%. The rate of agenesis was higher in female than in males, but the difference was not statistically significant.

Table I shows the distribution of dental anomalies by malocclusion group. Tooth agenesis and ectopic eruption were frequently found in class I malocclusion. Impaction was significantly lower in the Class II and Class II Division 2 groups than in both the Class I and Class III groups. Supernumerary teeth were found 1.4% in the study sample.

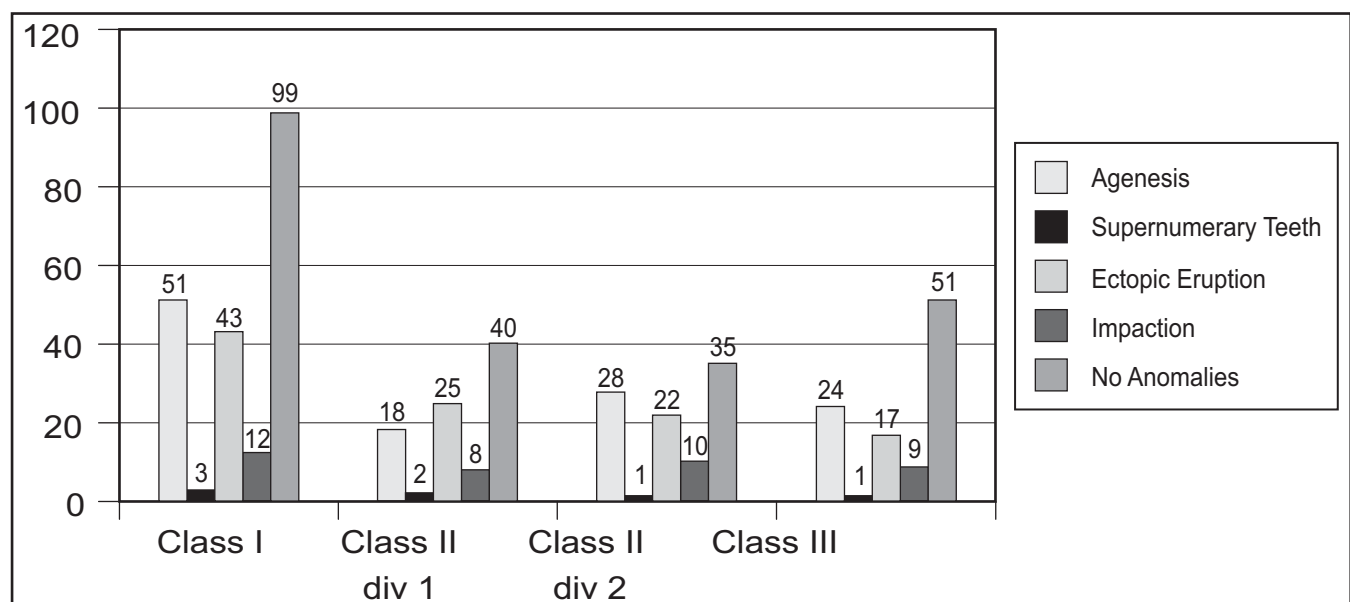


Fig 1: Distribution of subjects with dental anomalies in each malocclusion group.

TABLE 1: DISTRIBUTION OF DENTAL ANOMALIES BY MALOCCLUSION GROUPS

		Malocclusion				Total
		Class I	Class II div 1	Class II div 2	Class III	
Anomalies	Agenesis	55	18	28	24	125
	Supernumerary Teeth	3	2	1	1	7
	Ectopic Eruption	43	25	22	17	107
	Impaction	12	8	10	9	39
	No Anomalies	99	40	35	51	225
Total		212	93	96	102	503

TABLE 2: CROSSTABULATION OF ANOMALIES IN RELATION TO GENDER.

		Anomalies					Total
		Agenesis	Supernume- rary teeth	Ectopic eruption	impaction	No anomalies	
Gender	Male	32	5	28	16	77	158
	Female	93	2	79	23	148	345
Total		125	7	107	39	225	503

TABLE 3: FREQUENCY & PERCENTAGE OF MALOCCLUSION AND ANOMALIES.

		Malocclusion			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	Class I	212	42.1	42.1	42.1
	Class I div 1	93	18.5	18.5	60.6
	Class II div 2	96	19.1	19.1	79.7
	Class III	102	20.3	20.3	100.0
	Total	503	100.0	100.0	

		Anomalies			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	Agenesis	125	24.9	24.9	24.9
	Supernumerary teeth	7	1.4	1.4	26.2
	Ectopic eruption	107	21.3	21.3	47.5
	Impaction	39	7.8	7.8	55.3
	No Anomalies	225	44.7	44.7	100.0
	Total	503	100.0	100.0	

DISCUSSION

In this study, 55.3% of the total study group had at least one dental anomaly. Thongudomporn and Freer⁷ reported a higher rate of 74.78% in a study of 111 orthodontic patients and explained this finding, which was higher than previous random sample studies, as a result

of orthodontic patient's tendency to have more dental anomalies than the general population. However, they did not classify orthodontic malocclusions as we did according to distinct skeletodental characteristics.

Tooth agenesis is the most clearly recognized developmental dental anomaly in humans and can be

challenging to manage clinically. There are large differences in the prevalence of dental agenesis among different racial populations. Dental agenesis affects more frequently the permanent rather than the primary dentition.⁶ We also found that the most prevalent dental anomaly was tooth agenesis, observed in 24.9% of the study sample. Agenesis was most prevalent in the maxillary and mandibular posterior regions, followed by the maxillary anterior region, and the maxillary and mandibular premolar regions; it was least prevalent in the mandibular anterior region.

Uslu et al.¹ reported that supernumerary teeth were observed in 0.3% and ectopic eruption in 0.6% of the total study sample; both occurred only in the maxillary anterior region. The most common site of supernumerary teeth is the maxillary anterior region, and the incidence of malocclusion among children with hyperdontia was reported to be 83.3%.⁴ Lind⁵ showed that 3.6% of 1717 Swedish orthodontic patients had supernumerary teeth. Kotsomititis et al.³ reported a 29.4% prevalence of ectopic eruption. In this study we found that supernumerary teeth were 1.4% and ectopic eruption 21.3%. The prevalence of ectopic eruption was reported to vary according to race and region.^{1, 12, 13, 14, 15}

According to the literature, impacted permanent maxillary canines occur in 1% to 3% of the population.^{4, 16} Statistically significant differences in impaction rates were observed between malocclusion groups, with the Class II and Class II Division 2 groups having the lowest rates. However, Basdra et al.⁴ reported a high rate in impacted canines (33.5%) in 267 subjects with Class II Division 2 malocclusion. In this study 7.8% of impaction canines were seen more frequently in Class I and class II Division 2 malocclusion.

In general, girls report and seek orthodontic treatment more frequently than boys.^{8, 10, 11} This factor was reflected in the sample of the present study as well. No malocclusion group had statistically significant multiple dental anomalies (2 or more) in this study. However, Class I group had the highest rate, followed by the, Class II Division 2, class II Division 1 and Class III groups.

CONCLUSION

A significant numbers of orthodontic patients had at least one dental anomaly (55.3%) in this study. A

remarkably high rate of dental anomalies was recorded in orthodontic patients. Dental anomalies reflected higher frequency in females, presumably because of the higher number of female gender seeking orthodontic treatment. The difference in prevalence compared with previous studies might arise from racial differences or differences in diagnostic criteria.

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