

# PREVALENCE OF DENTAL ANOMALIES IN ORTHODONTIC PATIENTS

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## ABSTRACT

*This study was done to determine prevalence of dental anomalies in orthodontics in a sample of Peshawar population.*

*Panoramic (OPG) examination was done of 150 patients on standard light boxes, under good lighting conditions, standardized screen brightness and resolution to determine the dental anomalies. Patients' dental records and radiographs were examined in order to detect the dental anomalies: congenitally missing teeth, impactions, ectopic eruption, supernumerary teeth, dilacerations, microdontia, and any other unusual finding that can be assessed with OPG. Cleft lip and palate, syndromic and patients with metabolic disorders were excluded from the study.*

*Mean age calculated was 17.11  $\pm$  3.1 years. Maximum age was 30 years and minimum age was 13. There were 70 male cases and 80 cases of female. Male to Female ratio 1:1.14. Eighty nine (59.3%) patients had dental anomalies of various types. Forty-two patients (28%) were found with missing teeth. Third molar was most common missing tooth. Third molar impaction carried the highest percentage (10.3%) followed by maxillary canine (4.1%). Six cases had supernumerary teeth (4.1%) while three have odontomes (2%).*

*Panoramic radiograph have a key role in diagnosis of many dental anomalies. In this sample 59.3% patients have dental anomalies of different kinds.*

**Key Words:** Prevalence, Dental anomalies, Orthodontics treatment.

## INTRODUCTION

Dental anomalies in tooth number, shape, structure, and position may lead to problems in arch length and occlusion. This can adversely affect treatment planning for the orthodontists. The etiology of these dental anomalies is usually due to genetic, environmental and pathological factors.<sup>1-3</sup> According to Sarnat and Schour<sup>4</sup>, the developing tooth undergoes variations and fluctuations in the tooth matrix and its mineralization during its development. Dental anomalies occur during various stages of development. These anomalies may be restricted to one tooth or involve many teeth. They may or may not be the part of any systemic disorders or syndromes.<sup>5</sup> One or more dental anomalies can often be

observed in the same patient. Studies on the patterns of association among several types of dental anomalies in an untreated orthodontic population aged 7 to 14 years found a significant reciprocal association among 5 of the anomalies that suggests a common genetic origin. It was found that 34% of the patients with conical-shaped upper lateral incisors had palatally displaced canine.<sup>6</sup>

Congenitally missing teeth is most common developmental anomaly; occurring in approximately 25% of the Brazilian population. The wisdom tooth represents the most common missing tooth (20.7%).<sup>7</sup> Excluding third molars, the prevalence of tooth agenesis is approximately 4.3 to 7.8% in Chinese population, and the mandibular second premolars are the most commonly missing teeth, followed by the maxillary lateral incisors and maxillary second premolars.<sup>8</sup>

Impacted teeth play a significant role in the etiology of different types of malocclusions. The permanent maxillary canines develop close to nasal cavity, far from the dental arch, and, therefore, have the longest eruption path compared to other permanent teeth. In about 1.5% of population, the canines show an ectopic eruption path towards the palate.<sup>7</sup> The orthodontic implication of this dental anomaly beside preventing the canines to erupt spontaneously, in a significant number of cases, could lead to root resorption of neigh-

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boring teeth and cyst formation.<sup>9</sup> Peck et al<sup>10</sup> postulated that genetics are the essential etiological factor in the palatally displaced canines.

Prevalence of dental anomalies varies in different populations of Pakistan. In a study of Lahore population reported that the prevalence of missing teeth (excluding third molars) was 6.08%. Most patients with hypodontia were missing just one (57.1%) or 2(28.5%) but the rest (14.2%) were missing more than two teeth.<sup>11</sup> In another study in Karachi population, the prevalence of hypodontia, hyperdontia and impactions are found to be 3.38%, 0.95% and 8.57 respectively was reported. The objective of this study was to determine prevalence of dental anomalies in orthodontics patients in a sample of Peshawar population.

## METHODOLOGY

This cross-sectional descriptive study was conducted in department of Orthodontics, Khyber College of Dentistry, Peshawar from March 2015 to October 2015. One hundred and fifty patients having age range from 13 to 30 years were consecutively selected for this study. Panoramic radiographs of patient were used for identification of dental anomalies. The sampling was done on basis of following criteria.

### Inclusion criteria

- OPG of high clarity
- Both gender
- Patients belong to KPK
- Cooperative patients
- No previous orthodontic treatment

### Exclusion criteria

- Patients with syndrome
- Patients had extraction for any reasons of permanent teeth
- History of trauma to the maxilla and mandibles
- Metabolic disorders
- Cleft lip and palate patients.

The panoramic radiographs were examined on standard light boxes, under good lighting conditions, standardized screen brightness and resolution to determine the dental anomalies. Patients' dental records and radiographs were examined in order to detect the following dental anomalies: congenitally missing teeth, impactions, supernumerary teeth, dilacerations, microdontia, and any other unusual finding that can be assessed with OPG.

## RESULTS

Data was observed of 150 patients. Mean age calculated was  $17.11 \pm 3.1$  years. Maximum age was 30 years and minimum age was 13. There were 70 male cases and 80 cases of female. Male to Female ratio 1:1.14. Eighty-nine (59.3%) patients had dental anomalies of different kinds. Forty-two patients (28%) were found with missing teeth. Third molar was most common missing tooth. (Table 1)

Third molar impaction carried the highest percentage (10.3%) followed by maxillary canine (4.1%). The details are given in Table 2. Six cases had supernumerary teeth (4.1%) while three had odontomes (2%). The details of prevalence of other dental anomalies are given in Table 3.

## DISCUSSION

Orthodontic patients have been reported to have high rates of dental anomalies.<sup>9,10</sup> Inadequate consideration of these dental anomalies can complicate orthodontic treatment; therefore, their presence should be thoroughly investigated during orthodontic diagnosis and carefully considered during treatment planning.

Number of males in current study is less than the females. In earlier studies done on orthodontic patients, higher female to male ratio have been observed.<sup>12</sup> Because females are more concerned about their beauty and esthetics and in many societies esthetics of girls are given importance.

The prevalence of dental anomalies reported in this study was rather high (59.3%). This could be attributed to a large extent to the anomalies of the wisdom teeth. A high prevalence of congenitally missing and impaction of wisdom teeth is reported in this study. One limitation to this finding is that the impactions were not classified (e.g., partial or fully impacted) and the angulation of impaction was not taken into consideration. In support

TABLE 1: PREVALENCE AND PATTERNS OF MISSING TEETH

Missing tooth	Male	Female	Total
Third molar	20(13.33%)	22(14.6%)	42(28.0%)
Lateral incisor	1(0.66%)	2(1.33%)	3(2%)
Premolar	1(0.66%)	1(0.66%)	2(1.3%)

TABLE 2: PREVALENCE AND PATTERNS OF IMPACTED TEETH

Impacted tooth	Male	Female	Total
Maxillary Canine	2(1.33%)	4(2.6%)	6(4.1%)
Second molar	1(0.66%)	1(0.66%)	1.3%
Third molar	9(6%)	7(4.3%)	16(10.3%)
Premolar	2(1.33%)	1(0.66%)	3(2%)

TABLE 3: PREVALENCE AND PATTERNS OF OTHER DENTAL ANOMALIES

Dental anomalies	Male	Female	Total
Supernumerary	3(2%)	3(2%)	6(4.1%)
Microdontia	1(0.66%)	1(0.66%)	2(1.3%)
Dilaceration	1(0.66%)	1(0.66%)	2(1.3%)
Odontoma	2(1.33%)	1(0.66%)	3(2%)
Transposition	1(0.66%)	0(0%)	1(0.66%)

of the current study, Afify ARet al<sup>5</sup> conducted a study on the prevalence of dental anomalies in the western region of Saudi Arabia and reported 45% prevalence of dental anomalies. However, the sample size was much greater than the current study.

In the current study the most commonly missing and impacted tooth was third molar. These finding supported by many authors in local and international studies.<sup>5,6,10,11</sup> Third molar is last tooth to erupt; normally at age 18 to 22 years of age. Jaws finished sagittal growth before this age so it gets impacted. Evolutionary changes involved reduction in tooth number; it may be a reason for large number of missing third molar.<sup>13</sup>

Supernumerary teeth are a frequent finding in dental practice. The prevalence of hyperdontia is reported to lie between 4% in permanent dentition. The prevalence of 4% of supernumerary teeth as reported in the present study near to the range of 0.1-3.8% as reported earlier.<sup>14</sup> Bäckman and Wahlin<sup>15</sup> found 14 cases with one supernumerary tooth in a study in the Caucasian population. In their study, majority of the supernumerary teeth were mesiodens. Another study of large sample (2,393) Saudi Arabian children had the prevalence of supernumerary tooth to be 0.5%.<sup>16</sup> The prevalence of supernumerary teeth in the western region of Saudi Arabia was reported to be 0.3%. Most supernumerary teeth are impacted and asymptomatic and diagnosed incidentally during radiographic examinations. Panoramic radiograph is thus essential for the early detection of supernumerary teeth. However, clinical complications are not uncommon in patients with supernumerary teeth. Tooth displacement and failure of eruption are the most frequently seen complications.<sup>3</sup>

Dilaceration may considered normal when tooth is fully erupted for other dental professionals but orthodontist it poses many problems in tooth movement. In the current study prevalence of dilaceration was 1.3%. These results are in accordance with the findings of Patil S et al.<sup>17</sup>

## CONCLUSION

- Panoramic radiograph have a key role in diagnosis of many dental anomalies.
- In this sample 59.3% patients have dental anomalies of different kinds.

## REFERENCES

- 1 Basdra EK, Kiokpasoglou M, Stellzig A. The Class II Division 2 craniofacial type is associated with numerous congenital tooth anomalies. *Eur J Orthod* 2000; 22: 529-35.
- 2 Baydas B, Oktay H, Metin Dagsuyu I. The effect of heritability on Bolton tooth-size discrepancy. *Eur J Orthod* 2005; 27: 98-102.
- 3 Kotsomitis N, Dunne MP, Freer TJ. A genetic aetiology for some common dental anomalies: a pilot twin study. *Aust Orthod J* 1996; 14: 172-81.
- 4 Sarnat BG, Schour I. Enamel hypoplasias (chronologic enamel aplasia) in relation to systemic disease: a chronologic, morphologic and etiologic classification. *J Am Dent Assoc.* 1941; 28: 1989-2000.
- 5 Afify AR, Zawawi KH. The prevalence of dental anomalies in the western region of Saudi Arabia. *S ISRN Dent* 2012; 2012: 837270.
- 6 Baccetti T. A controlled study of associated dental anomalies. *Angle Orthod* 1998; 68: 267-74.
- 7 Garib DG, Peck S, Gomes SC. Increased occurrence of dental anomalies associated with second-premolar agenesis. *Angle Orthod* 2009; 79(3): 436-41.
- 8 Polder BJ, Van't Hof MA, Van Der Linden FPG, Kuijpers-Jagtman AM Meta-analysis of the prevalence of dental agenesis of permanent teeth. *Comm Dent Oral Epidemiol* 2004; 32(3): 217-26.
- 9 Ericson S, Kurol J. Resorption of incisors after ectopic eruption of maxillary canines: a CT study. *Angle Orthod* 2000; 70(6): 415-23.
- 10 Peck S, Peck L, Kataja M. The palatally displaced canine as a dental anomaly of genetic origin. *Angle Orthod* 1994; 64(4): 249-56.
- 11 AMIN F. Prevalence of hypodontia in orthodontic patients in a Pakistani sample — a study. *Pak Oral Dent J* 2010; 30(1): 142-45.
- 12 Majeed MM, Ahmed I, Uzair M, Atif M. Prevalence of missing, impacted and supernumerary teeth in patients under orthodontic treatment in a teaching hospital of Karachi, Pakistan. *Int J Dent Health Sci* 2014; 1(1): 39-46.
- 13 Juodzbalsys G, Daugela, P. Mandibular third molar impaction: review of literature and a proposal of a classification. *J Oral Maxillofacresearch* 2013; 4(2): 45-48.
- 14 Fardi A, Kondylidou-Sidira A, Bachour Z, Parisis N, Tsirlis A. Incidence of impacted and supernumerary teeth- a radiographic study in a North Greek population. *Med Oral Patol Oral Cir Bucal* 2011; 16: 56-61.
- 15 Bäckman B, Wahlin YB. Variations in number and morphology of permanent teeth in 7-9 year-old Swedish children. *Int J Paediatr Dent* 2001; 11: 11-17.
- 16 Salem G. Prevalence of selected dental anomalies in Saudi Children from Gizan region. *Comm Dent Oral Epidemiol* 1989; 17: 162-63.
- 17 Patil S, Doni B, Kaswan S, Rahman F. Prevalence of dental anomalies in Indian population. *J Clin Experiment Dent* 2013; 5(4): 183-86.

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<b>4 Irfan Khattak:</b>	Statistical analysis
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