PREVALENCE OF SUPERNUMARARIES AND THEIR ASSOCIATION WITH CONGENITAL ABSENCE OF THIRD MOLARS IN ORTHODONTIC PATIENTS

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ABSTRACT

The purpose of this study was to determine the association of supernumararies with the congenital absence of permanent third molars and any other dental anomaly in orthodontic patients. Prevalence of supernumararies was also noted.

Dental records (History sheets, Dental casts & panoramic radiographs) of 228 orthodontic patients (39.5% males, 64% females) with an age range of 9-45 years, were randomly selected. Patients with cleft lip & palate, ectodermal dysplasia or having any syndrome were excluded from the study.

Prevalence of supernumararies in orthodontic patients was 3.9% (9 patients).

Mesiodens were present in two patients (0.87%), Para molars in six patients (2.6%) and distomolar was present in only one patient (0.43%).

Female to male ratio was 2:1 and left to right ratio was 5:2.

No association was found between existence of supernumararies and congenital absence of third molars. Insignificant association was found between presence of supernumararies and any other associated dental anomalies.

Key Words: Supernumerary, Third molars, Association.

INTRODUCTION

There is gradual transition from primary dentition to permanent dentition. Normally 20 primary teeth erupt in a child and 32 permanent teeth (16 teeth/arch) erupt in an adolescent. Sometimes there is a congenital absence of one or few permanent teeth, which results from disturbances during the initial stages of formation of a tooth- initiation and proliferation.1

In rare occasions, one or few extra teeth are present called as supernumararies. Supernumerary or extra teeth also result from disturbances during the initiation and proliferation stages of dental development.

Supernumerary teeth, or hyperdontia, is an odontostomatologic anomaly and may be defined as any tooth substance in excess of the usual configuration of 20 deciduous and 32 permanent teeth.2 Supernumerary teeth may occur singly, multiply, unilaterally or bilaterally, erupted or impacted, in one or both jaws, and in the deciduous as well as in permanent dentition. The reported prevalence of supernumerary teeth in the permanent dentition ranges from 0.1% to 3.8% and from 0.3% to 0.6% in the deciduous dentition.3

Supernumerary teeth can be found in almost any region of the dental arch. These teeth have a striking predilection for maxilla over mandible.4

Supernumerary teeth are classified according to their position in the dental arch or their morphological form. Positional variations include mesiodens, paramolars, distomolars, and parapremolars. A mesioden is a typical conical supernumerary tooth located between the maxillary central incisors; a paramolar is a supernumerary molar usually small and rudimentary, situated buccally or palatally to one of the maxillary molars or most commonly occurs in the interproximal space buccal to the upper second and third molars; a distomolar is a fourth permanent molar, which is usually placed either directly distal or distolingual to the third molar; and a parapremolar most commonly occurs in the interproximal space buccal or palatal to the upper first and second premolars. Variation in morphological form consists of conical types, tuberculated types, supplemental teeth, and odontomes.5

By missing teeth is meant those teeth whose germ did not develop sufficiently to allow the differentiation of the dental tissues. According to moyers6 there are five principal known causes of congenital absence of teeth. Heredity, ectodermal dysplasia, conditions such
as rickets, syphilis and expression of evolutionary changes in the dentition. Some authorities believe that, in future, man will have neither third molars nor maxillary lateral incisors just as we have already seen to have lost fourth molars.

One should not forget the relationship between congenital absence of teeth and generalized tooth size diminution. When one tooth is not developing it is important to measure all of the other teeth to ascertain any genetic field effects on general tooth size.

The most distal tooth within each group displays the greatest variability in size is the most apt to be congenitally missing and is most frequently abnormal in shape.

The purpose of this study was to find out any association between the congenital absence of third molar and occurrence of supernumerary tooth. Any other associated dental anomaly was also noted.

**METHODOLOGY**

Pretreatment panoramic radiographs, history sheets and dental casts of 228 orthodontic patients between the chronological ages of 9 and 45 years (mean age 19.6 years) were examined. Sample included 87 males, mean age 15.9 years and 141 females with a mean age of 16.9 years Fig 1.

Subjects were drawn from the department of orthodontics faculty of dentistry, The University of Lahore, Pakistan. Panoramic radiographs were used to confirm the presence/absence of supernumaries and the congenital absence of third molars. 9 years of age was chosen as the lower limit because the late forming 3rd molars starts crown mineralization at about 9 years of age. Also the size of each permanent third molar tooth and supernumerary tooth was assessed in panoramic radiograph, which was later on confirmed by dental casts. Dental history sheets were reliable for documenting extractions especially of supernumerary and to rule out the presence of any systemic or metabolic disease.

The prevalence of supernumaries was calculated with respect to morphology and position. Nominal logistic regression analysis was used to test for sex and side differences. Most statistical studies were performed with software SPSS.

**RESULTS**

Prevalence of supernumaries in orthodontic patients was 3.9% (9 patients). Mesiodens were present in two patients (0.87%), Para molars in six patients (2.6%) and distomolar was present in only one patient (0.43%).

Left upper quadrant was involved in 5 patients (55.5%) and right upper quadrant was involved in 2 patients (0.87%). It was noticed that no supernumerary was found in the lower arch.

All of the permanent third molars were present in patients having supernumerary teeth. So, no association was found between the existence of supernumaries and congenital absence of third molars. Permanent third molars were not visible in panoramic radiograph of one patient which reported with presence of mesiodens in the midline area between central incisors at an age of 9 years. Female to male ratio was 2:1 and left to right ratio was 5:2 Table 1. Insignificant association was found between presence of supernumaries and any other associated dental anomaly. Table 2

**DISCUSSION**

Developmental anomalies of the dentition are frequently observed in orthodontic patients. Anomalies in tooth number, shape, and position may lead to disturbances in maxillary and mandibular arch length and

<table>
<thead>
<tr>
<th>No. of cases</th>
<th>Age/Sex</th>
<th>Mesiodens</th>
<th>Paramolar</th>
<th>Distomolar</th>
<th>Side/Quadrant involved</th>
<th>Status of Third Molars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17Y/M**</td>
<td>buccal to 27</td>
<td></td>
<td>distomolar</td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>2</td>
<td>20Y/F***</td>
<td></td>
<td></td>
<td>distal to 28</td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>3</td>
<td>20Y/F</td>
<td></td>
<td>buccal to 28</td>
<td></td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>4</td>
<td>21Y/F</td>
<td></td>
<td>buccal to 18</td>
<td></td>
<td>right upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>5</td>
<td>9Y/M</td>
<td>between 11 &amp; 21</td>
<td></td>
<td></td>
<td>left upper</td>
<td>18,28,38,48 not visible</td>
</tr>
<tr>
<td>6</td>
<td>22Y/M</td>
<td></td>
<td>buccal to 28</td>
<td></td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>7</td>
<td>14Y/F</td>
<td></td>
<td>buccal to 18</td>
<td></td>
<td>right upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>8</td>
<td>21Y/F</td>
<td></td>
<td>buccal to 28</td>
<td></td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
<tr>
<td>9</td>
<td>10Y/F</td>
<td>between 11 &amp; 21</td>
<td></td>
<td></td>
<td>left upper</td>
<td>18,28,38,48 present</td>
</tr>
</tbody>
</table>

*Years **Males ***Females
Prevalence of supernumaries

occlusion, which may complicate orthodontic treatment planning. There have been various studies investigating the prevalence of various dental anomalies including agenesis, crown shape, tooth position, transposition, ectopic eruption, infraocclusion and supernumerary teeth. Only a few have been conducted on orthodontic patients. Prevalence of supernumerary teeth and their association with congenital absence of third molars was noted in the present study.

According to position, supernumerary teeth are classified as mesiodens, paramolar, parapremolar and distomolar. The occurrence of supernumary is relatively uncommon. The exact etiology of this anomaly is still not completely understood.

According to shape, supernumerary teeth are classified as supplemental (eumorphic) and rudimentary (dysmorphic). If the supernumerary teeth present a normal morphology, it is denoted as “supplemental” if they presented morphologic and volumetric anomalies they are referred to as rudimentary. The supernumerary teeth position can be recorded as ‘between central incisors’ and ‘overlap’ and its orientation can be described as ‘vertical’, ‘inverted’, and ‘transverse’.

In the present study, percentage of mesiodens, paramolars and distomolars were calculated. The prevalence of supernumaries as a whole was 3.9% in orthodontic patients. In another study, 415 orthodontic patients were assessed for occurrence of congenital dental anomalies. The subjects of the present study were 200 class III (110 females, 90 males) and 215 class II division 1 (101 females, 114 males) patients. Supernumerary teeth were found in 3.5% in the class III group and in 1.4% in the class II division 1 subjects.

In a Brazilian sample of 203 orthodontic patients aged 8-22 years, prevalence of supernumerary was also noted. It was 3% (6/203). Lind showed that 3.6% of 1717 swedish orthodontic patients had supernumerary teeth. In all the above mentioned studies, percentage of supernumerary teeth in orthodontic patients was within the range of 3.0-3.9% regardless of racial and regional variation. But its prevalence was noted low in a recent study which was 1.4% and was found even less in another study which was 0.3%. In the present study and other studies percentage of supernumerary in orthodontic patients was also within the observed rates for the general population.

In a previous study, more than half of supernumaries were found in premaxilla as mesiodens. The most common site of supernumerary teeth was the maxillary anterior region, observed by another study. In the present study, mesiodens were present in two patients (0.87%), para molars in six patients (2.6%) and distomolar was present in only one patient (0.43%). The prevalence of paramolar was high in the present study as compared to other studies where it

<table>
<thead>
<tr>
<th>No. of cases</th>
<th>Age/sex</th>
<th>Status of third molars</th>
<th>Size variation of third molar &amp; lateral incisor</th>
<th>Congenital absence of third molars</th>
<th>Presence of supernumaries</th>
<th>Associated anomaly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23 years/F*</td>
<td>18, 28, 38, 48 present</td>
<td>smaller size 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>20 years/F</td>
<td>38 present</td>
<td></td>
<td></td>
<td>18,28,48 absent</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>19 years/F</td>
<td>18, 28, 38, 48 present</td>
<td>smaller size 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>21 years/F</td>
<td>18, 28, 48 present</td>
<td>smaller size 28, 22</td>
<td>38 absent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20 years/F</td>
<td>18, 28, 38, 48 present</td>
<td>smaller size 22</td>
<td></td>
<td>distomolar</td>
<td>distal to 28</td>
</tr>
<tr>
<td>6</td>
<td>11 years/F</td>
<td>18, 28, 38, 48 present</td>
<td></td>
<td></td>
<td>mesiodens</td>
<td>between 11 &amp; 21</td>
</tr>
</tbody>
</table>

*Females

![Gender distribution](image)

In the present study, all supernumerary teeth were present in maxilla and no supernumerary teeth were found in mandible. Theses results also showed similarity to other studies.

<table>
<thead>
<tr>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>228</td>
</tr>
<tr>
<td>141</td>
</tr>
<tr>
<td>87</td>
</tr>
</tbody>
</table>

Fig 1: Gender distribution

TABLE 2: PRESENCE/ABSENCE OF THIRD MOLARS, PRESENCE OF SUPERNUMERARY AND ANY OTHER ASSOCIATED ANOMALIES

In the present study and other studies percentage of supernumerary in orthodontic patients was also within the observed rates for the general population. In the present study, all supernumerary teeth were present in maxilla and no supernumerary teeth were found in mandible. Theses results also showed similarity to other studies.

In a previous study, more than half of supernumaries were found in premaxilla as mesiodens. The most common site of supernumerary teeth was the maxillary anterior region, observed by another study.

In the present study, mesiodens were present in two patients (0.87%), para molars in six patients (2.6%) and distomolar was present in only one patient (0.43%).
was quite low, rarely bilateral, extremely rare in primary dentition and only one such case has been reported. They are usually rudimentary, mostly situated buccally between the second and third molars, whereas in very rare cases they can be found between the first and second molars. In this study, all paramolars were situated buccally, four paramolar on left upper quadrant and two paramolar on right upper quadrant. Size of paramolar was similar to premolar in two patients. In a case report, the actual size of the extracted paramolar was measured with a caliper. The mesiodistal and buccopalatal width of the crown was 6 and 10 mm, respectively. The length of the crown was 6.5 mm, whereas the length of the root was 12 mm. The morphometric measurements displayed that the paramolar had very close values relative to the maxillary premolar.

Maxillary third molars have the greatest morphologic variance of all teeth. The great amount of variation in maxillary third molars also makes a great description difficult. The crown may have only one cusp or as many as eight.

When the present study was assessed with respect to the any other associated dental anomalies in patients having supernumararies, in one of the patient with mesiodens between 11 and 21, small palatal cusps were present on palatal surface of 12 and 22. Table 2

In another patient, having distomolar distal to 28, smaller size 22 was also present. But in all other patients, no other significant dental anomaly was noted.

CONCLUSION

Prevalence of supernumararies was 3.9% in orthodontic patients of Pakistan. It was 2.6% for paramolars, 0.87% for mesiodens and 0.43% for distomolars. No supernumerary was found in lower arch. No association was found between supernumararies and congenital absence of permanent third molars.

REFERENCES