Vetting of selected dental anomalies associated with anterior teeth
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Abstract

Background: Dental anomalies can lead to various complications. Screening of subjects at an early age to detect these anomalies if present, which can be managed by simple treatment options, may prevent complicated treatment procedures at a later date.

Aims and Objectives: The aim of this study was to evaluate the prevalence of dental anomalies associated with the anterior teeth in the permanent dentition, of individuals with age group ranging between 19 and 24 years without any syndromes.

Materials and Methods: A total of 265 cases were screened for any defects associated with the upper and lower anterior teeth. We carried out a thorough clinical examination to analyze the prevalence of microdontia, macrodontia, talon cusp, fusion, dens invaginatus, transposition, retained deciduous teeth, and supernumerary teeth.

Results: Our study included 265 subjects, out of which 39 cases presented with dental anomalies were recorded. The common dental anomalies found in the group were as follows: 8% of cases with congenitally missing teeth, 1.71% of cases with supernumerary teeth, 5.71% with macrodontia, 5.71% with microdontia, and 1.14% retained deciduous teeth.

Conclusion: Developmental dental anomalies are evident clinically, which result in different dental deformities. The pursuit of the present study was to determine the frequency with which various developmental dental anomalies in anterior teeth occur in non-syndromic patients. It was seen that these anomalies did not vary much between the males and females. Macrodontia, supernumerary teeth, peg-shaped lateral incisors (microdontia), and congenital missing teeth outnumbered the other dental anomalies in our study. Attentive observation and applicable investigations are needed to diagnosticate the condition and regulate pertinent treatment. Antecedent diagnosis can result in early intervention and treatment if necessary.

Keywords
Anterior teeth, macrodontia, microdontia, supernumerary teeth

Introduction

Dental anomalies which are of developmental origin can give rise to a variety of dental problems. Cautious observation and adapted investigations may be essential for diagnosis, followed by treatment if required. These anomalies constitute an important category of variations in the tooth morphology. They may present with deviations from the normal color, contour, size, number, and degree of tooth development is what defines them. Developmental disturbances could arise due to local and systemic factors that may occur before birth or following birth resulting in the involvement of deciduous and/or permanent teeth. Morphodifferentiations stage during the tooth development is responsible for the size, shape, and structure of the teeth. Thus, any disturbances in this stage can alter the size, morphology, and the structure of the tooth. Disturbances in the eruption pattern can result in the missing, rotation, impaction, and ectopic eruption of the teeth.

Conflicting results have been obtained by various studies done on the distribution of developmental anomalies of the teeth in different populations.

This study was carried out to assess the distribution of selected developmental dental abnormalities affecting the shape, structure, number, and position of teeth in a population, where these data could contribute to the existing literature.
Materials and Methods

The study was conducted by clinical examination on selected subjects, who visited the outpatient department at A.B Shetty Memorial Institute of Dental Sciences, Mangalore, between June 2015 and May 2016. An informed consent was obtained from the patients who were screened for the presence of anterior teeth anomalies between the age ranges of 19-24 years. During the clinical examination, the presence of selected anomalies such as the presence of macrodontia, microdontia, fusion, retained deciduous teeth, talon cusp, supernumerary teeth, and transposition of teeth was looked for. Subjects of Indian origin were only selected. The exclusion criteria included as follows:

1. Patients of the age group <19 years.
2. Patients who have undergone orthodontic treatment or tooth extraction.
3. Patients with various syndromes such as ectodermal dysplasia and Down’s syndrome.
4. Patients with cleft lip and palate.
5. Dental anomalies occurring due to disturbance in structure of teeth, such as hypoplasia secondary to dentinogenesis imperfecta, amelogenesis imperfecta, or dental fluorosis.

Results

A total of 39 of the 265 subjects presented with anomalies involving the anterior teeth, who were included in the group. They consisted of 21 (53.85%) male and 18 (46.15%) female patients [Figure 1].

The distribution of various anomalies among male and female subjects is delineated in Table 1.

The common dental anomalies found in the group were as follows: 8% of cases with congenitally missing teeth (CMT), 1.71% of cases with supernumerary teeth, 5.71% with macrodontia, 5.71% with microdontia, and 1.14% retained deciduous teeth [Tables 2-4 and Figure 2].

Discussion

Anomalies in tooth development are considerable deviations from the size, number, color, contour, and degree of development of teeth in the normal scenario. Influences of local and systemic factors that may begin before birth or after may be responsible for the development of these anomalies. Anomalies affecting the teeth could be congenital or acquired. They may appear to be isolated or be associated with other syndromes. Changes in the number of teeth, their location, size, shape, or any other structural changes are reflection of the anomalies of tooth development. The etiology of these anomalies are shown in Table 5.[4]

Our study included 265 subjects who were subjected to clinical examination. Out of which, 39 cases showed presence of various dental anomalies which were recorded. Dental anomalies found in our study were as follows: 8% of cases with CMT, 1.71% of cases with supernumerary teeth, 5.71% with macrodontia, 5.71% with microdontia, and 1.14% with retained deciduous which were seen either involving maxillary or mandibular dentition.

When one or more than one teeth are smaller and deviate from the normal range, microdontia is considered.[9] Maxillary lateral incisors and third molars are the teeth being affected, frequently. 0.8-8.4% is the reported prevalence of this condition in different populations.[10] Our present study

![Figure 1: Gender distribution among the subjects with tooth anomalies](image)
Anterior teeth anomalies

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Figure 2: Frequency of various anomalies

Table 5: Causes of developmental dental anomalies

<table>
<thead>
<tr>
<th>Congenital anomalies</th>
<th>Acquired anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereditary (approximately one quarter)</td>
<td>Malnutrition (energetic and protein deficit)</td>
</tr>
<tr>
<td>Multicausal etiology (rest)</td>
<td>Influence of chemical substances</td>
</tr>
<tr>
<td>External factors (only 1%)</td>
<td>Infections, especially of viral etiology (2‑3%)</td>
</tr>
<tr>
<td></td>
<td>Disturbances of metabolism (2%)</td>
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</table>

showed 3 cases of microdontia. When lateral incisors are affected, the mesiodistal diameter of the tooth reduces, and there is convergence seen toward the incisal edge, and these teeth are referred as peg-shaped incisors. This condition is predominantly of genetic origin. Peg-shaped lateral incisors (5.71%) accounted for the total anomalies presenting as microdontia in our study.

Talon cusps are morphologically well-defined anomaly of the teeth which extend up to the middle-third of the tooth extending from the cementoenamel junction to the incisal edge on the lingual aspect. This anomaly was so called due to the horn-like shaped curve on the palatal surfaces of the incisors. Hattab et al. have classified it into three types which were based on the degree of cusp formation and extension.

Talon (type I)

A morphologically well-delineated entity is represented by a prominent projection of the additional cusp from the palatal or lingual surface of a primary or permanent anterior tooth. The cusp develops across to at least half of the crown of the tooth clinically from the cementoenamel junction (CEJ) to the incisal edge.

Semi talon (type II)

A semi talon is an additional cusp of a millimeter or more that tends to extend over less than half of the crown of the tooth clinically from CEJ to the incisal edge. It could blend with the palatal or lingual surface of the crown or stand away from the remaining part of the crown.

Trace talon (type III)

Present as enlarged or prominent cingula. Variants of trace talon include conical, bifid, or tubercle like. The prevalence of talons cusp ranged from <1% to 8% of the population with a gender predilection to males than females. In the present study, we did not record any cases of talon cusp. Clinical significance is the occurrence of caries between the accessory cusp and the tooth in the pits or deep developmental grooves. Sensitivity or devitalization of the tooth as a result of fracture or attrition of the extended portion of the cusp that has pulp tissue is the various dental problems that clinicians encounter with these supplementary extensions of tooth structure.

A dental transposition (transmigration) is when a tooth erupts in the erroneous sequence in the dental arch. Frequently encountered dental transposition is with a maxillary canine is placed distal to the first premolar. Usually, these teeth are mistaken for supernumerary teeth.

The cause of this canine-premolar transposition or ectopic canine is unclear, but there is assumption that it could be associated with multifactorial disorders which might involve genetic factors. Our study did not come across any dental transposition in relation to the anterior teeth.

Fusion is referred to as an infrequently occurring anomaly of the teeth that are united by dentin. This union could be total or partial and may show two independent root canals or less frequently a single root and one or two pulp chambers. Fusion can be of suspicion when there is reduced number of teeth in the arch and/or two roots are seen radiographically.

In this study, only 5.71% of cases presented with macrodontia with respect to central and lateral incisors. Macrodontia is considered when one or more teeth are larger in size than those within the normal range. Macrodontia is also called as megalodontia, megadontia, or gigantism. Macrodontia can be classified as generalized and localized. Generalized is further divided as true generalized or relative generalized. In true generalized type, all or at least most of the teeth are unusually larger than normal teeth. Relative generalized macrodontia is when relatively small jaws have normal or slightly larger than normal teeth. When a single tooth shows increased size without alteration in the crown, root, and pulp morphology, it is called localized macrodontia.

Supernumerary teeth in the dentition may occur when a permanent or primary dental lamina shows continued proliferation to form a third tooth germ. Supernumerary teeth are frequently seen involving the permanent dentition than the primary dentition. Maxilla is more commonly affected than the mandible in the ratio of 10:1.

Supernumerary teeth can be supplemental type in which the extra teeth resemble the teeth of the group to which they belong, molars (paramolars or distomolars), premolars, or anterior teeth (mesiodens). The prevalence of supernumerary teeth is reported to be 0.8% in primary dentition and 2.1% in permanent dentitions. Multiple supernumerary teeth are common with syndromes or other associated diseases. In the present study,
only 1.71% of cases which were associated with the mesiodens was reported.

Retained deciduous teeth are the primary teeth that are still present despite the eruption of permanent teeth, or the permanent teeth have unerupted as the primary teeth did not exfoliate.

Primary teeth may be retained due to the following reasons, and the most common cause is the absence of succeeding permanent teeth. Primary teeth agenesis is rare (0.1-0.9%), but the absence of permanent teeth is relatively common occurrence and its prevalence is in the range of 2.5-6.9%. Maxillary deciduous canines were retained in 1.14% of the cases in the present study.

CMT are the most common developmental and congenital dental anomaly is tooth agenesis. CMT refer to when one or more missing teeth. Tooth germ did not develop sufficiently to allow the differentiation of the dental tissues may be the cause. It may be sporadic or hereditary syndromes.

There are three types of CMT:
1. Hypodontia - <6 teeth.
2. Oligodontia - six or more teeth are missing.
3. Anodontia - complete absence of teeth, usually seen with ectodermal dysplasia.

According to epidemiological studies, one or both of the maxillary lateral incisors are congenitally missing in approximately 2% of the population. The third molars are the most common missing teeth, followed by mandibular second premolars and then by the maxillary lateral incisors. In the present study, 8% of the population had congenitally missing anterior teeth in relation to maxillary lateral incisor and mandibular central incisor.

Conclusion
This study is an attempt to appraise the frequency of presentation of various dental anomalies associated with the anterior teeth due to developmental disturbances in a non-syndromic population. The data showed that these anomalies did not vary much between the males and females. Macroodontia, supernumerary teeth, peg-shaped laterals (microodontia), congenital missing teeth, and retained deciduous teeth were the common anomalies seen in comparison with other developmental disturbances. These are evident on clinical examination and can be diagnosed by keen observation and appropriate investigation. Early diagnosis can prevent complicated treatment interventions.

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References
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