CASE REPORT

Congenitally Missing Anterior teeth in a 7 year old child: Review and Case Report

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Abstract

Oligodontia is agenesis of numerous teeth (> 6), excluding the third molars. Its prevalence in permanent teeth has been estimated to be 0.14%. It is one of the most common anomaly affecting the permanent dentition but equally infrequent in the primary dentition. Presented here is a case report of 7 year old child with congenitally missing 10 primary anteriors in both maxillary and mandibular dental arches with subsequently missing 4 permanent anterior teeth in the mandibular arch.


Key words: Oligodontia, Congenitally missing anteriors, missing canine

Introduction

An edentulous smile might look appealing in an infant but its persistence is a serious cause of concern for the parents and the child. According to Shapiro, congenital absence of teeth is most common dental anomaly in human with more prevalence in permanent dentition.¹ The reduction in number of teeth has been directly related with the reduction in the size of human jaw, this evolutionary trend is still believed to be continuing.²

Dental anomalies occur due to genetic or environmental factors which may result from various formative defects. A tooth is said to be congenitally missing when there is no evidence of its presence clinically and radiographically plus no history of previous extraction exists.³

Hypodontia is used to denote a condition with agenesis of one or few teeth. Hypodontia has significant psychological, aesthetic and functional consequences as it may result in dental mal positioning, periodontal damage, stunted development of maxilla and mandible bone height.

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According to Stewart, Oligodontia means agenesis of numerous teeth (more than 6); excluding the third molars.\(^4\) Prevalence of oligodontia in permanent teeth has been estimated to be 0.14%.\(^5\) Difference in male and female distribution is not significant, nor is the difference between right and left maxillary and mandibular arch. However, combining data from various studies show higher frequency of oligodontia in females.\(^6\) The causes of oligodontia are hereditary, trauma, infection, radiation, metabolic disorders and idiopathic. It can occur alone or in combination with syndrome like ectodermal dysplasia. Henceforth, resulting clinical features are reduced lower facial height, impaired growth of alveolar process, pseudo-prognathism, speech impairment and deep bite all of which have a physiological and psychosocial impact over an individual.

A classical study was conducted by Grahen in 1956 on parents and siblings of 171 hypodontia patients, which concluded that, in majority of the cases, oligodontia is mainly determined by an autosomal dominant gene pattern with variable expressivity and an incomplete penetrance of the trait.\(^7\)

**Case Report**

A 7½ years old male Indian patient was brought by his grandfather to our department with a complaint of missing lower and upper front teeth since birth. The child was healthy, well nourished with appropriate physical and mental growth for his age. Patient did not have any adverse oral hygiene habits; had sound sleep, incompetent lips and a habit of mouth breathing. The peri-natal history was unremarkable. The history of trauma to the concerned region was absent. No other person in the family reported with the same condition.

The child had mesomorphoric facial structure. Examination for any craniofacial abnormalities (Figure 1 and Figure 2) was negative since his hair, skin, nails, eyebrows and eyelashes were all found to be normal. Bone deformities were absent.

Intra-oral examination (Figure 3) revealed presence of normal complement of teeth for his age except for primary mandibular incisors and canines along with primary maxillary incisors. Oral hygiene was good with absence of stains, debris or dental caries.

Thin alveolar ridge and high lingual frenum was also evident. Bulge was observed in the maxillary anterior region which was suspected to be due to erupting permanent incisors. The finding was later on affirmed by radiograph (Figure 4). The teeth present were normal in morphology.
Figure 4: Orthopantamograph showing the missing primary teeth and Developing tooth buds of permanent teeth in both maxillary and mandibular arch.

Panoramic radiograph (Figure 4) confirmed the absence of primary upper incisors and lower incisors as well as canines. The permanent mandibular central incisors were also missing. The tooth buds of permanent maxillary central incisor were present.

Considering the history, clinical and radiographic findings diagnosis of Oligodontia was concluded. Informed written consent was obtained from his grandfather after which, with the thought of promoting esthetics and psychological well being of the child a removable partial denture was planned. Teeth selection was done under natural light. Impression of both mandible and maxillary arches were made using alginate impression material. Then, the impression was poured with dental stone. The casts were mounted on articulator and jaw relation was established. A wax pattern was made with c clasps on both the first primary molars followed by anterior teeth arrangement of the mandibular arch, using central and lateral incisors. After the satisfactory try in of the removable partial denture, acrylisation was done using compression moulding technique. On the subsequent appointment denture was delivered to the patient (Figure 5) after checking for proper occlusion and fit. Post operative instructions were given. After 1 month recall, patient was satisfied with the esthetics and functioning of the removable partial denture.

Figure 5: Photograph showing the removable partial denture after placement

Discussion

The prevalence of hypodontia is strongly affected by race and ethnicity. It has been estimated to be between 2% and 10% in permanent dentition and less than 1% in the primary dentition. There’s no significant male to female ratio difference with more predilection for maxilla. The most common primary missing teeth are maxillary lateral incisors and mandibular central and lateral incisors, while the least common missing teeth are canines.

Several mechanisms have been proposed to explain congenitally missing teeth. Butler’s Field theory states that the distal teeth within each morphological class are developmentally less stable. Therefore, canine stands alone in its own field displaying great stability and hence, is rarely congenitally missing. Sofaer et al. suggested that greater variability seen in teeth that form later in each morphological class may be a result of the interaction of tooth germs during development. In cleft patients MSX1 is associated with agenesis of first, second and third molars. Mice lacking MSX1 had cleft palate, deficient mandibular or maxillary alveolar bones and
failure of tooth development. Agenesis of only 1 or 2 teeth cannot be explained by MSX1 mutation.

The importance of eruption of primary and then permanent anterior teeth coupled with concomitant growth of the alveolar ridge height lies in receding the frenum at the mucogingival junction.\textsuperscript{10}

Treatment of hypodontia is especially important when several teeth are missing as it can affect the facial development as well as lead to malocclusion. The treatment depends on the age of patient. Conservative rigid or fixed prosthesis may be used if growth is completed. Comprehensive orthodontic tooth movement and selective extraction of teeth can be done. The patient will be monitored every six months to determine the need to refit or remake his denture. This will act as a transit period and further development of dentofacial structures will be evaluated.

Tooth agenesis is a matter of concern for parents. Pedodontist might be the first one consulted for diagnosis and treatment planning regarding the same. Therefore after predicting the future eruption-growth patterns, measuring pros and cons of multifarious treatment modalities, an efficient management must dominate.

Although dream of genetically engineered teeth still remains a distant one, the study of tooth agenesis and genes involved in the experimental tooth regeneration have led to tooth regeneration techniques such as tissue scaffolding and tooth engineering. In addition association of AXIN2, PAX9 with colorectal cancer has shown, potential of using tooth agenesis as a genetic marker for diagnosis of cancer.\textsuperscript{7}

Conclusion
This is a classical case of oligodontia with multiple missing primary and permanent teeth. It is unique firstly with regard to the number of teeth involved. Secondly because of non-syndromic nature (example: Reiger’s syndrome, Marshall’s syndrome, Lacrimo-auriculo-dento-digital syndrome, Down’s syndrome and Ectodermal dysplasia). Thirdly, due to congenital absence of canines and lastly, radiographic evidence of this case showed presence of maxillary permanent central incisors tooth bud. Ranta and Maroto have suggested a hereditary cause for oligodontia.\textsuperscript{11,12}

Tooth agenesis is the most prevalent craniofacial malformation in humans and 2\textsuperscript{nd} pre molar most common missing tooth.\textsuperscript{7} There’s a need for a thorough diagnosis and efficient management to last a life time.

References