

Bilateral Agenesis of Permanent Mandibular Central Incisors: Report of Two Cases

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Abstract:

General dentists most commonly encounter one or more congenitally missing teeth on routine oral examination. Hypodontia and oligodontia are the two most commonly encountered genetic disorders. When one or less than six teeth are missing congenitally they are termed hypodontia. Environmental factors, radiation, trauma, infection, genetic mutations have all been considered as the probable cause for hypodontia. Well documentation of such condition becomes necessary to enrich the knowledge about congenitally missing teeth.

Key Words: Agenesis, aplasia, hypodontia

Introduction

The most commonly encountered developmental anomalies in humans are dental agenesis. Missing teeth have been explained under various terms in literature which includes anodontia, hypodontia, oligodontia, aplasia of teeth, congenitally missing teeth, absence of teeth, and agenesis of teeth. Oligodontia and hypodontia are two relative terms in which congenital absence of six or more teeth excluding molars refers to oligodontia and congenital absence of teeth less than six in number excluding molars refers to hypodontia. The most common congenitally missing teeth are the maxillary lateral incisors followed by maxillary second premolars and mandibular central incisors. There may be unilateral or bilateral absence of teeth.¹

The prevalence of hypodontia is rare in primary dentition approximating to 0.1-0.9% when compared to prevalence rate of 2-10% in permanent dentition.² Congenital absence of mandibular incisors has exhibited racial ethnicity towards Japanese, Chinese and Korean population. Females have shown higher predilection than males.³

Documentation of such case reports is necessary due to its rarity, to provide a review to minimize the clinicians challenge in diagnosing such cases and thus helpful in providing a multidisciplinary approach in treating the patient.⁴

Case Reports

Case 1

A 22-year-old female patient reported to the dental clinic with chief complaint of spacing between the teeth and wanted to get it orthodontically corrected. On general physical examination patient's height, weight, built and nourishment corresponds with the chronological age. Intra oral examination of the lower arch, revealed the presence of retained deciduous mandibular incisor which was firm and situated in the midline between the permanent mandibular lateral incisors (Figure 1).

Patient's medical history was inconspicuous. There was no familial history of supernumerary tooth or congenitally missing teeth. History of trauma and dental extractions could not be elicited from clinical examination. On radiographic examination there was absence of permanent mandibular incisor tooth buds (Figure 2).

Case 2

A 18-year-old female patient reported to the dental clinic with chief complaint of spacing between the teeth and wanted to get treated by replacement through prosthesis. On general physical examination patient's height, weight, built and nourishment corresponds with the chronological age. On intra oral examination, the patient had spacing between the right and left permanent mandibular lateral incisors and the two permanent mandibular central incisors were missing (Figure 3).

Patient's medical history was inconspicuous. A familial history of supernumerary tooth or congenitally missing teeth could not be elicited. History of trauma and dental extractions could not be elicited from clinical examination. On radiographic examination there was absence of permanent mandibular incisor tooth buds (Figure 4).



Figure 1: Clinical picture shows retained deciduous mandibular central incisor between the permanent mandibular lateral incisors.

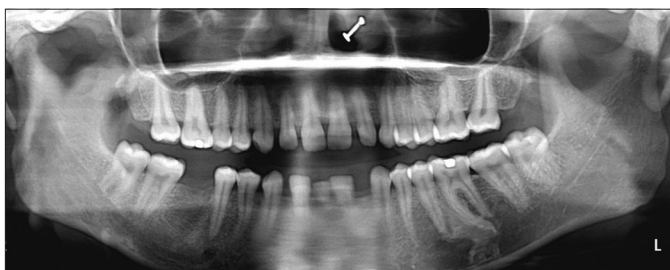


Figure 2: Orthopantomogram of the patient reveals absence of central incisors and the presence of retained deciduous mandibular incisor.

Discussion

Agenesis or missing teeth is considered when it can neither be observed clinically, nor radiographically, and also when there is no history of trauma or extraction. Hypodontia is a congenital absence of one or more teeth in primary or permanent dentition. Individuals reported with hypodontia may give a familial history or may exhibit no hereditary history. Occurrence of hypodontia is rare in primary dentition when compared to permanent dentition. Many systemic conditions such as Down syndrome, Hypohidrotic ectodermal dysplasia, Chondroectodermal dysplasia and Van Der Woude syndrome, have presented hypodontia as a common feature on clinical examination.^{5,6}

Hypodontia along with other developmental anomalies such as peg shaped laterals, supernumerary teeth, ectopic eruption of maxillary permanent first molar all considered as micro symptoms of hereditary disturbance which occur due to disturbance in the development of tooth structure.⁵

Several factors like infection, trauma, metabolic disorders, radiation, environmental, genetic factors and idiopathic are considered as possible etiological factors of congenital agenesis. Various theories have been put forth to locate the exact cause of congenital agenesis of incisors. In 1998 Newman and Newman have proposed four theories which mainly explain the cause of agenesis. Firstly, may be due to familial or hereditary distribution. Secondly, during the formation of mandibular symphysis the tooth buds that form the lower incisors could



Figure 3: Clinical photograph shows spacing in between the permanent mandibular lateral incisors and the absence of central incisors.



Figure 4: Orthopantomogram reveals the absence of permanent mandibular central incisors.

be disturbed leading to agenesis. Thirdly, failure in attempting to locate itself in the short dental arches and thus leading to reduction in dentition and finally, localized infections or inflammations in the jaws leading to disturbed dental tissue buds causing agenesis.^{3,4}

Genetic factors like MSX1 and PAX9 have been explained in the development of incisors. Disturbances in the interaction between these factors are also considered as a main etiologic factor for congenital missing teeth.^{6,7}

Biologically, congenital absence of permanent teeth is attributed to failure in proliferation of lingual or distal tooth buds from the dental lamina.⁶

Various studies have revealed that the morphology and growth pattern of mandibular symphysis has been affected by the congenital absence of mandibular incisors.⁸

MSX1 not only plays vital role in tooth agenesis but also associated with craniofacial abnormalities. Varied craniofacial morphology and mandibular symphysis morphology may be attributed with genetic heterogeneity for hypodontia which is in turn associated with mandibular incisor agenesis.⁸

The extent of hypodontia poses many problem like facial appearance, malocclusion, difficulty in mastication and speech and lack of confidence in making a social life. Interdisciplinary approach in treating these conditions becomes necessary to

provide a better treatment plan for the patient. Care should be taken to thoroughly document the clinical history as well as medical and radiological examination to rule out any systemic conditions associated with congenitally missing teeth.^{6,9}

Conclusion

Cases of agenesis need to be well diagnosed by the dental fraternity to provide comprehensive range of treatment modalities and thus help in restoring esthetics and functioning in the individuals with agenesis.

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