Case Report

ISOLATED AGENESIS OF A MAXILLARY CENTRAL INCISOR: A case report and literature review

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ABSTRACT

Background: Hypodontia is one of the most common developmental anomalies in humans. The most frequently missing tooth is the third molar. Agenesis of maxillary central incisors is extremely rare.

Objective: This article reports a rare case of agenesis of the left maxillary central incisor in our practice, without any associated problems.

Case Report: A 15-year-old girl who presented with agenesis of the maxillary left central incisor. There was no history of previous extraction of the upper left central incisor and no associated odontome, no systemic disease, or family history of oligodontia. The patient was generally well. Systemic examination was essentially normal. Intraoral examination showed that she had a full complement of teeth, except for the missing maxillary left central incisor. The standard occlusal radiograph of the patient revealed that the left maxillary central incisor was missing.

Conclusion: The cause of the agenesis resulting in this rare condition is not clear, but may be due to inadequate secretion of some of the signaling molecules or localized absence of their receptors in the ectomesenchyme destined to differentiate into the left maxillary central incisor.

Keywords: Maxillary Incisor, Isolated Agenesis

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INTRODUCTION

Hypodontia is one of the most common developmental anomalies, with a prevalence rate of 2.3 -9.6 % (excluding the third molars) in the normal population.[1] It is more frequently seen in the permanent dentition compared with the primary.[2] Absence of maxillary central incisors, maxillary and mandibular first molars, and canines seems to be very rare.[3-6] Hypodontia in permanent dentition is considered a variant of normal. It can occur alone or it may be associated with other anomalies.[3]

The third molar is the most commonly found missing tooth in the permanent dentition, being absent in about one-fifth of the population.[3] Among the remaining 28 teeth, the most frequently affected are mandibular second premolars (41 %), maxillary lateral incisors (23 %), maxillary second premolars (21 %), and the mandibular incisors (6 %), but missing maxillary central incisors is a very rare condition if not associated with other anomalies like ectodermal dysplasia.[7-9] There is no known case of isolated agenesis of a maxillary central incisor from

previous publications. The agenesis of teeth may be isolated or associated with a syndromic state, such as Down's syndrome, Crouzon syndrome, Witcope and Reiger's syndrome.[10-11] The objective of this study was to report this rare case of isolated agenesis in our practice without any associated problems

CASE REPORT

A 15-year-old girl presented with a complaint of spaces between the maxillary incisors. A review of the patient's medical, dental, and family histories revealed no significant findings. Clinical examination showed mild spacing of the maxillary anterior segment, mild proclination of the maxillary anterior teeth, and a missing left maxillary central incisor. The permanent teeth present in the maxillary arch are the right central incisor, right and left lateral incisors, first and second premolars on the right and left, the right and left permanent canines, and the first and second permanent molars (Fig. 1 and Fig. 2).

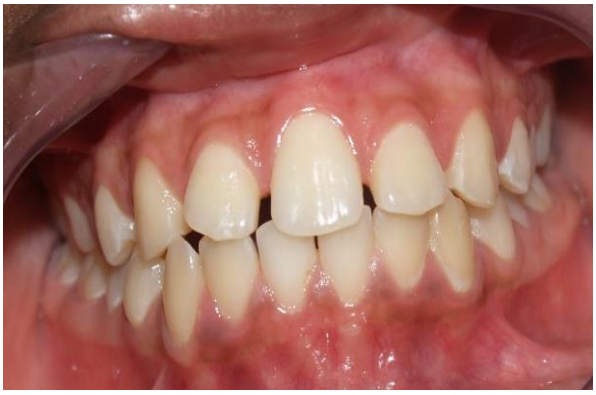

Fig 1: Pretreatment intraoral photograph, frontal view showing missing maxillary left canal incisor.

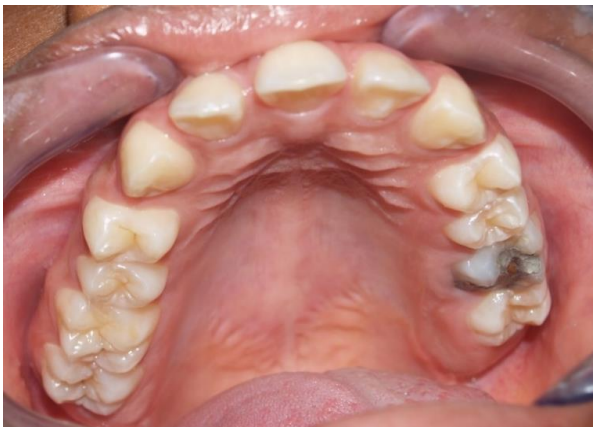

Fig 2: Pretreatment intraoral photograph occlusal view of maxillary teeth with a missing upper central incisor.

While in the mandibular arch, the central incisors, lateral incisors, canines, first and second premolars on the right and left, and the first and second permanent molars were present (Fig. 3).

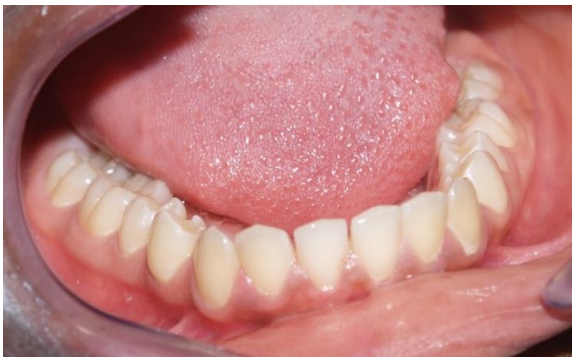

Fig 3: Pretreatment intraoral photograph of the occlusal view of the mandibular teeth

Radiographic investigation (standard occlusal-Fig. 4) confirmed that the tooth was congenitally missing. The treatment plan for the patient consists of upper and lower fixed orthodontic appliance treatment following a thorough assessment. After the alignment of the teeth, the plan is to replace the missing tooth with a prosthesis. Initially, this will be a resin-bonded bridge, and later, when the patient turns 18 years, an implant prosthesis will be placed. The patient started orthodontic treatment; however, the implant prosthesis was not implemented due to her parents' relocation.

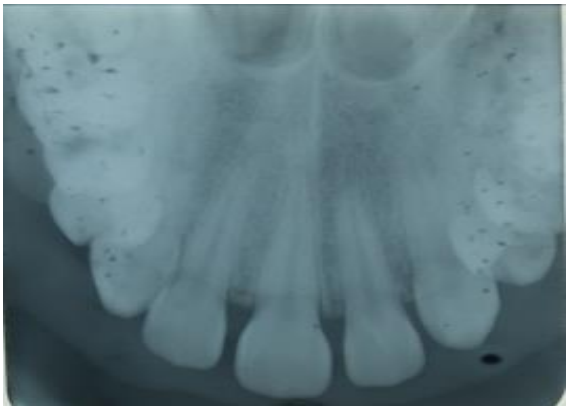

Fig 4: Pretreatment standard occlusal radiograph of the maxillary arch

DISCUSSION

Agenesis of teeth is more frequently seen in the maxilla and in females. Previous study[12] stated that a mutation in the gene encoding the beta-catenin binding protein AXIN 2 has been associated with sporadic forms of incisor agenesis. The agenesis of teeth may be isolated or associated with a syndromic state, such as Down's syndrome, Crouzon's syndrome, and Witkope and Rieger's syndrome.[11]

The cause of the failure of development of the left maxillary central incisor in this case is unknown, as the patient has no syndromic state, history of exposure to chemotherapy or radiation, and tooth bud gouging, common in some parts of Africa, is not known in this part of the continent.[13] Unilateral agenesis of teeth is more frequently encountered than bilateral cases, apart from agenesis of the premolars, where bilaterality is 1-5 times more common.[14] The cause of agenesis of teeth is divided into three major groups: agenesis related to the supporting tissues.[15] An example of the first group is Ellis-van Creveld syndrome, or chondro-ectodermal dysplasia, which is associated with agenesis of both primary and secondary teeth in the anterior mandibular segment. In this condition, there is an abnormality of cartilage formation that does not support the development of tooth germs and prevents the extension of the lower alveolar nerve into the mandibular bone, thus causing agenesis in the region.

Anodontia due to an abnormality in the oral epithelium is exemplified by ectodermal dysplasia and incontinentia pigmenti (Bloch-Sulzberger syndrome). In these two conditions, there is dysmorphogenesis of tissues of ectodermal origin, such as the eyes, hair, teeth, and nails.[16,17] Agenesis attributed to a lack of innervation of the jaws is relatively uncommon. However, neutrophins, especially nerve growth factor, seem to play some important role in the initiation of odontogenesis.[18] The agenesis of teeth in the normal population follows a well-known pattern designated as the "normal pattern of agenesis", while that in congenital craniofacial malformation reveals a mixed, unsystematic pattern of distribution described as the "atypical pattern of agenesis".[15] Other factors considered to be of importance in agenesis of teeth include environmental stress, such as poor nutrition, infection, and chronic lead ingestion in tissues.[15]

CONCLUSION

We present a case of agenesis of the left maxillary central incisor in a 15-year-old girl with no family history of oligodontia and with no syndrome. The cause of the agenesis of the left maxillary central incisor in this patient is not clear, but may be due to inadequate secretion of some of the signaling molecules or localized absence of their receptor in the ectomesenchyme destined to differentiate into the left maxillary central incisor. A genetic study of this patient would have been appropriate, but for the lack of the required facilities.

Conflict of Interest: None declared

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