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Bilateral Mandibular Permanent Canine Agenesis: A Rare Case Report.

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ABSTRACT

Dental agenesis or hypodontia is the absence of one or more primary or permanent teeth. It is the most common developmental anomaly in humans. The most frequently missing teeth in the permanent dentition, excluding the third molars, are the mandibular second premolars and the maxillary lateral incisors. Exclusive agenesis of both the permanent mandibular canines is an extremely rare occurrence in a non-syndromic patient. This paper will discuss on a rare case of bilateral mandibular permanent canine agenesis in a non-syndromic 11 year old female patient.

Keywords: Agenesis, Hypodontia, Canines, Bilateral.

INTRODUCTION

Dental agenesis or Hypodontia is used to describe the absence of one or more primary or permanent teeth.[1] It is the most common developmental anomaly in humans, often presenting a significant clinical problem. It may result in dental malposition, periodontal damage, lack of maxillary and mandibular bone height development, aesthetic and functional consequences.[2] Dental agenesis in the permanent dentition has been considered as the most common reason for the retention of the deciduous tooth.[3] Studies have shown that hypodontia affects the maxillary arch more than the mandibular arch. Most common congenitally missing permanent teeth, excluding the third molars are the mandibular second premolar (3.4%) and the maxillary lateral incisor (2.2%).[4]

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Congenital absence of the canines in the permanent dentition is very rare with the incidence reported to be 0.23% by Bergestrom[5], 0.45% by Davis[6], 0.18% by Fukuta.[7] The incidence of congenitally missing permanent canine was found to be 0.1% in the maxilla and 0.02% of mandible in a survey of congenitally missing teeth, excluding third molar in 6000 orthodontic patients by Rose.[8] Fukuta et al in their study showed that male to female ratio affected by congenital absence of permanent canine was 1:2, with left side of maxilla and in the mandible right side being affected more.[7]

The association of dental agenesis with syndromes and dental anomalies have also been reported in literature. These include Rieger syndrome, Witkop syndrome, Book syndrome, Down syndrome, oral and facial clefts, hemifacial microsomia and many others.[9,10] Dental agenesis has also been shown to accompany other conditions, such as microdontia, palatal impaction of canines, taurodontism, tooth transposition and rotation, ectopic eruption, retained primary teeth and alveolar bone hypoplasia.[9-11]

Dental agenesis may be unilateral or bilateral. There are reports showing unilateral occurrence of permanent mandibular canines but agenesis of bilateral (both right and left) mandibular canines is not well documented in literature.

This article will discuss on a rare case of bilateral mandibular permanent canine agenesis in a non-syndromic 11 year old female patient.

CASE REPORT

A 11 year old female patient reported to the Department of Pediatric and Preventive dentistry, Meenakshi Ammal Dental College and Hospital, with the chief complaint of sensitivity in the upper right back tooth region of the jaw for the past 2 days. On Clinical examination presence of secondary

caries in 16 and unerupted 33 and 43 were noticed. The prenatal, natal, postnatal history, family history and medical history were not significant. As a routine radiographic investigation to assess the eruption status of canines, OPG was taken and congenital agenesis of both the mandibular canines were noticed. The old restoration was removed in 16 and was restored with Glass-ionomer cement.

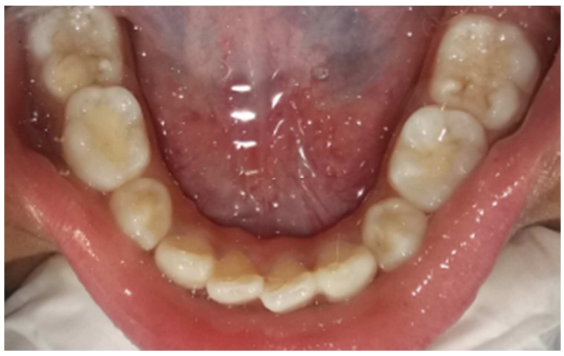

Figure 1: Lower arch showing bilateral permanent canine agenesis.

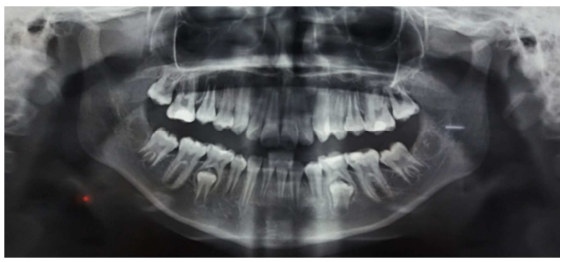

Figure 2: OPG showing Bilateral permanent Canine agenesis.

DISCUSSION

Congenital canine agenesis is a rare condition.[12] Autosomal dominant (AD), autosomal recessive (AR) and X-linked recessive pattern of inheritance have been associated with dental agenesis; with AD pattern being the most prominent.[13] The aetiology of dental agenesis has been suggested to be multifactorial, which combines genetic, epigenetic and environmental factors.[8] The genetic or the familial inheritance has been suggested as a more significant aetiological factor. Environmental factors like tooth bud infection, trauma, maternal medication, nutritional disturbances during pregnancy or infancy, irradiation at early stage and somatic diseases (scarlet fever, syphilis and rickets) are also associated with dental agenesis.[6] Some of the regulatory homeobox genes – MAX1, PAX9, EDA and AXIN2 have been found to be associated with dental agenesis.[13]

Dental agenesis may also be a consequence of absence or severe damage to the appropriate dental lamina. The dental lamina is extremely sensitive to external insults like trauma, infection, radiation, physical obstruction or endocrine disturbances.[14] Disruption of the dental lamina, space limitation, functional abnormalities of the dental epithelium or failure of initiation of the underlying mesenchyme are all possible histologic explanations for that phenomenon.[15]

List of the genes and molecular pathways involved in tooth agenesis include[16]

- Wnt/b-catenin/LEF1
- MsxI
- Msx2
- SHH
- P63
- Pitx2
- Runx2/Cbfa1

Some of the treatment options for missing mandibular canine include no treatment, closure of spaces orthodontically, restoration with removable or fixed partial dentures, timely extraction of the primary predecessors to facilitate spontaneous space closure with or without further orthodontic alignment, followed by lateral incisor and first premolar coronoplasty, or to keep the primary canines and replace them with a suitable restoration when they are lost. An advantage of retaining the primary predecessor is that, alveolar resorption may be avoided until the late teens, providing the maximum potential for implant placement without the need for bone grafting. A referral to the orthodontist or the prosthodontist for definitive treatment will be needed for most cases.[12] In the present case since there was no space present in the mixed dentition stage, a definitive treatment can be done only after the eruption of all other permanent tooth into occlusion and hence the patient was kept under observation.

CONCLUSION

In conclusion this paper reports a rare case of bilateral congenitally missing mandibular permanent canines in a non-syndromic 11 year old female. The knowledge and understanding of such rare cases can be improved by reporting such cases. Treatment planning should be done based on the presentation of individual patient and considering their priorities for better oral health. So each patient has to be assessed individually to decide the most suitable treatment plan.

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