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CASE REPORT

Agenesis of a Mandibular Canine: A case report

Agénésie d'une canine mandibulaire: Un rapport de cas

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ABSTRACT

BACKGROUND: **Hypodontia is one of the most common developmental anomalies in man. The most frequently missing tooth is the third molar. Agenesis of canine in the secondary dentition is rarely reported .**

OBJECTIVE: **To report a very rare form of missing tooth in the secondary dentition due to agenesis.**

METHODS: **A 49-year Nigerian male consulted with a desire to have a dental check-up. Extra- and intr-oral exminayions werecarried out. Following observation of a amissing tooth orthopanthomograph was carried out. with a missing lower right canine. All other teeth were well formed and have all erupted into the oral cavity.**

RESULTS: **There was no history of systemic disease or family history of oligodontia and was generally well. Systemic examination was essentially normal. Intra oral examination revealed that he had full complement of teeth but for a missing lower right canine. There was a gap of about 2mm between the lower right lateral incisor and the lower right first premolar and a buccal displacement of the upper left second molar as well as a carious lesion on the upper first left molar. The orthopanthomograph showed that the tooth was not within the mandible in this patient.**

CONCLUSION: **The cause of the aplasia 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 ectomesenchye destined to differentiate into the right canine tooth. WAJM 2009; 28(6): 394–396.**

Keywords: **Agenesis, Canine, Mandibular, Oligodontia, Hypodontia.**

RÉSUMÉ

CONTEXTE: *Hypodontie est l'une des anomalies les plus communs du développement chez l'homme. La dent manquante la plus fréquemment est la troisième molaire. Agénésie de la canine de la denture secondaire est rarement rapportés.*

Objectif: Pour signaler une forme très rare de manquer dent de la denture secondaire due à une agénésie.

MÉTHODES: *A 49 ans Homme nigérian a consulté un désir d'avoir un check up dentaire. Extra-et intr-exminayions orale werecarried Out. Suite à l'observation d'un orthopanthomograph amissing dent a été effectuée. avec un manque en bas à droite canine. Toutes les autres dents sont bien formés et ont tous fait irruption dans la cavité buccale.*

Résultats: Il n'y avait pas d'antécédents de maladie systémique ou des antécédents familiaux de oligodontie et a été généralement bien. Examen systémique était essentiellement normal. Intra examen oral a révélé qu'il avait de compléter pleine de dents, mais pour un manquant en bas à droite canine. Il y avait un écart d'environ 2 mm entre la partie inférieure droite incisive latérale et la première prémolaire inférieure droite et un déplacement vestibulaire de la molaire supérieure gauche seconde ainsi que d'une lésion carieuse sur la première molaire gauche supérieur. Le orthopanthomograph a montré que la dent ne relevait pas de la mandibule chez ce patient.

CONCLUSION: *La cause de l'aplasie résultant de cette maladie rare n'est pas claire, mais mai-être dû à une sécrétion insuffisante d'une partie des molécules de signalisation ou localisée absence de leurs récepteurs dans le ectomesenchye destinée à se différencier en la canine de droite.* ***WAJM 2009; 28(6): 394–396.***

Mots-clés: *Agénésie; Canine; mandibulaires; oligodontie; Hypodontie*

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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] The most frequently missing teeth in the permanent dentition are the third molars with about 20% of the population having at least one missing.[3] Other teeth such as the upper second incisor and the upper and lower second premolars are also frequently missing with a regularity which suggests an orderly process that cannot be attributed to chance alone.[2,4] Agenesis of canine in the secondary dentition is extremely rare and is reported to occur in 0.06%–0.45% of the general population.[1] Most odontologists believe that the human dentition is in a transition period which will lead to an eventual reduction of the dentition to one canine, one incisor, one premolar and two molars per quadrant[5]. Agenesis of the canine teeth as well the first molars are extremely rare in the human dentition.[1]

Case report

A 49-year-old male Nigerian civil servant presented in the Oral Diagnosis and Oral Medicine clinic of the University College Hospital, Ibadan Southwestern Nigeria, with a desire to have a dental check-up. Extra oral examination revealed a healthy looking man with no history of systemic disease and no abnormality of the facies. Intra oral examination revealed a man with a full complement of teeth but for a missing lower right canine. There was a gap of about 2mm between the lower right lateral incisor and the lower right first premolar and a buccal displacement of the upper left second molar as well as a carious lesion on the upper first left molar (Figure 1). Apart from these no anomaly was detected in this patient.

The orthopanthomograph of this case was done to identify the site of impaction of the canine. It showed that the tooth was not within the mandible in this patient (Figure 2).

None of the complications associated with congenitally missing teeth such as supernumerary teeth, odontoma, persistent deciduous teeth was seen apart from the slight malocclusion due to the space distal to the lower right lateral incisor.

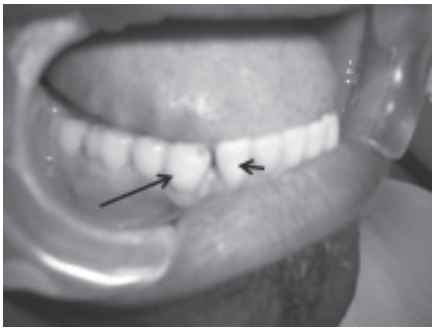

Fig. 1: Photograph showing missing right lower canine. The long arrow shows the first premolar, while the short arrow shows the lateral incisor

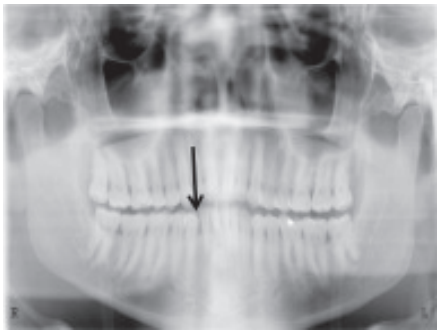

Fig. 2: Radiograph of jaw showing missing canine. There is a gap between the right lower first premolar and the lateral incisor indicated by the arrow.

DISCUSSION

Agenesis of teeth is more frequently seen in the maxilla and in females but this case involved the mandible in a male patient. This patient had a solitary canine agenesis which is more commonly seen than multiple canine agenesis.[1] The agenesis of teeth may be isolated or associated with a syndromic state, such as Down's syndrome, ectodermal dysplasia, Van de Woude syndrome, Crouzon's syndrome, and Witkope and Rieger's syndrome.[6] The isolated cases may be due to familial or sporadic causes such as foetal infection, cleft palate, radiologic or endocrine disturbance.[1] The mutation of certain genes such as MSX1 gene on chromosome four have been associated with agenesis of premolars, lateral incisors and third molars as well as cleft lip and palate. PAX9 mutation has been associated with agenesis of the molars.[7] The protein products of MSX1 and PAX9 serve as transcription factors that are responsible for the instructive and permissive cell-cell inductive interactions between epithelial and mesenchymal tissues during odonto-genesis.[6] The gene responsible for agenesis of the cuspids is unknown[8]. The cause of the failure of development of the mandibular canine in this case is unknown as the patient has no syndromic state, history of exposure to chemo-therapy or radiation and tooth bud gouging common in some parts of Africa is not known in this part of the continent.[9] 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.[10] Single agenesis of the canine is more common on the right as seen in this patient. Complications associated with missing canine such as microdontia, malocclusion, odontoma, persistent primary tooth retention, were not seen in this case.[1]

The cause of agenesis of teeth is divided into three major groups: agenesis related to the supporting tissues, agenesis related to the oral epithelium and agenesis related to the nerve tissue.[11]

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, which 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 abnormality in the oral epithelium is exemplified by ectodermal dysplasia and incontinentia pigmenti (Bloch-Sulzberger syndrome) the oral epithelium. In these two coditions there is dysmorphogenesis of tissues of ectodermal origin such as the eyes, hairs , teeth and nails.[12,13] Agenesis attributed to lack of innervation of the jaws is relatively uncommon. However, neurotrophins especially nerve growth factor seems to play some important role in the initiation odontogenesis.[14,15]

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 descibed as the 'atypical pattern of agenesis'.[11] Other factors considered to be of importance in agenesis of teeth include environmental stressors such as poor nutrition, infection, and chronic lead ingestion tissues.[11] Recently, a mutation in the gene encoding the beta-catenin binding protein AXIN 2 has been associated with sporadic forms of incisor agenesis and a risk of colorectal carcinoma.[3,7]

In conclusion, we present the case of agenesis of the lower right mandibular canine in a 49 year old Nigerian with no family history of oligodontia and with no syndrome. The cause of this aplasia is not clear but may be due to inadequate secretion of some of the signalling molecules or localized absence of their receptor in the ectomesenchye destined to differentiate into the right canine tooth. A genetic study of this patient would have been appropriate but for the lack of the required facilities.

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