

A Rare Case of Dental Morphological Anomaly - Upper Canine Bilateral Agenesis

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Abstract

Reduced hypodontia may be considered an expression of phylogenetic reduction or associated with other abnormalities. Reduced hypodontia is related to permanent dentition, and the characteristic disorders occur at the arcade and can lead to vocal impairment and facial expression and functions. It is often encountered in the mandibular lateral incisor, mandibular second premolar, and third molar end-of-series terminals, but it can also occur in the canine. The canine agenesis is very rare, ranging from 0.07 to 0.13%.

This study presents the case of a 17-year-old female patient with bilateral maxillary canine agenesis, upper lateral incisor aplasia, and second lower molar aplasia, lower canines included. Following the clinical and radiographic examination, treatment options were discussed.

Keywords: agenesis, hypodontia, canine

Introduction

Dental agenesis or anodontia is the congenital absence of the dental bud and, subsequently, the missing of the corresponding tooth on the arch, being one of the dental anomalies of number. It is often associated with other oro-dental anomalies such as cleft lip and palate, enamel hypoplasia, etc. The incidence of this anomaly is influenced by the type of dentition (i.e., temporary/permanent), gender, demographic, and geographic factors, but it has been found that there is also a genetic, hereditary component involved. Hypodontia - numerical teeth reduction may affect isolated teeth or entail a complete absence of dental buds (anodontia). It has been suggested that hypodontia is not only the most common dental anomaly but it also generates a large number of clinical complications that are not very easy to treat.[1]

The frequency of this abnormality is estimated to be around 4-5%. Hypodontia cases are considered phylogenetic by reducing the end-of-series teeth (wisdom teeth, second premolars, lateral incisors). This tendency to reduce the number and size of the teeth causes the disappearance of the wisdom teeth in 25% of all cases, followed by the lateral incisors in 12% and the premolars in 11% of the groups of patients with hypodontia. Permanent dentition is more frequently affected than the temporary one [2,3]. Epidemiological data show that the anomaly is present in the population in a share of 1.5-3%, and it has a frequency of 4.3% among other dental-maxillary abnormalities [4].

The prevalence of congenitally missing teeth (from now on CMT) in the general population was reported as ranging between 0.027% and 10.1%, with significant variations depending on geographical areas

and race [5,6]. In the general population, the lower second premolar is the most common missing tooth, followed by the lateral incisor and the mandibular second premolar [7]. A higher frequency was observed in the case of girls than in boys [7,8].

Hypodontia is frequently associated with maxillary dental developmental abnormalities (MDDA) and positional disorders of the teeth in place. [3-5] Agenesis of permanent canines in a non-syndromic patient is extremely rare. [6-8]

Case Presentation

The case presented herein describes a rare form of hypodontia, namely the bilateral agenesis of the maxillary, the upper lateral incisors associated with that permanent canines agenesis, and the agenesis of the lower second permanent molars. The absence of the buds of the third molars, both upper and lower, is also noted.

The 17-year-old female patient presented to the dental office for physiological reasons. The patient's personal medical history is irrelevant. At clinical examination, we noticed the patient's oval face, attenuated nasolabial folds, enhanced mental foramen, smaller lower facial height, positive ratio of the lips in positive lip step, convex facial profile with decreased lower facial height (see **Figure no.1**).

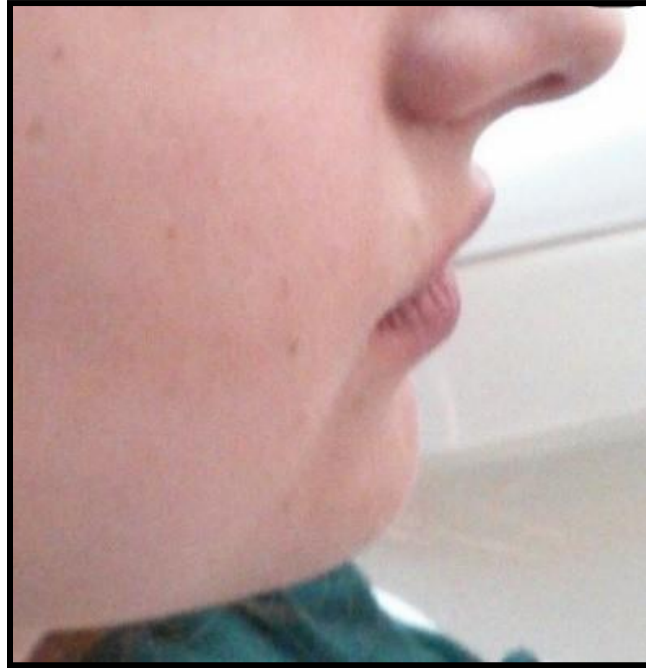


Figure 1: Lateral examination

Buccal mucosa examination showed a normal appearance and colouring. The patient presents a class II anomaly and canine and molar distalizations were reported (see **Figure no.2,3,4**).



Figure.2 Dental arch aspect



Figure.3 Right hemiarch: presence of 5.2 and 5.3



Figure.4 Second hemiarc: presence of 6.2 and 6.3

The presence of temporary teeth is noted in the teeth inventory: bilateral lateral incisors 5.2, 6.2, presence of upper temporary canines 5.3, 6.3, and presence of temporary canines 7.3, 8.3 in lower arch (see **Figure no.5,6**).



Figure.5 Upper arch



Figure.6 Lower arch aspect

Considering the age of the patient and the dental eruption timetable, during the clinical examination we presumed the absence of permanent teeth from the arch, and we recommended the patient to undergo OPG and CBCT. Patient's oral hygiene was satisfactory, and the clinical examination showed the absence of carious lesions. The radiological examination on the orthopantomogram (OPG)

shows the absence of dental buds of upper lateral incisors and canines on both dental hemiarchs (1.2 and 1.3, and 2.2 and 2.3), as well as the absence of the lower second molar buds (3.7 and 4.7), and teeth 3.3 and 4.3 in lower arch are included (see **Figure no.7**).



Figure 7: Ortopantomograma examination

Both the temporary lateral incisors and the temporary canines did not show any degree of root regrowth/risalisa.

Radiological CBCT also highlights the lack of permanent teeth buds, as well as the presence of canines included in the lower arcade (see **Figure no.8,9**).

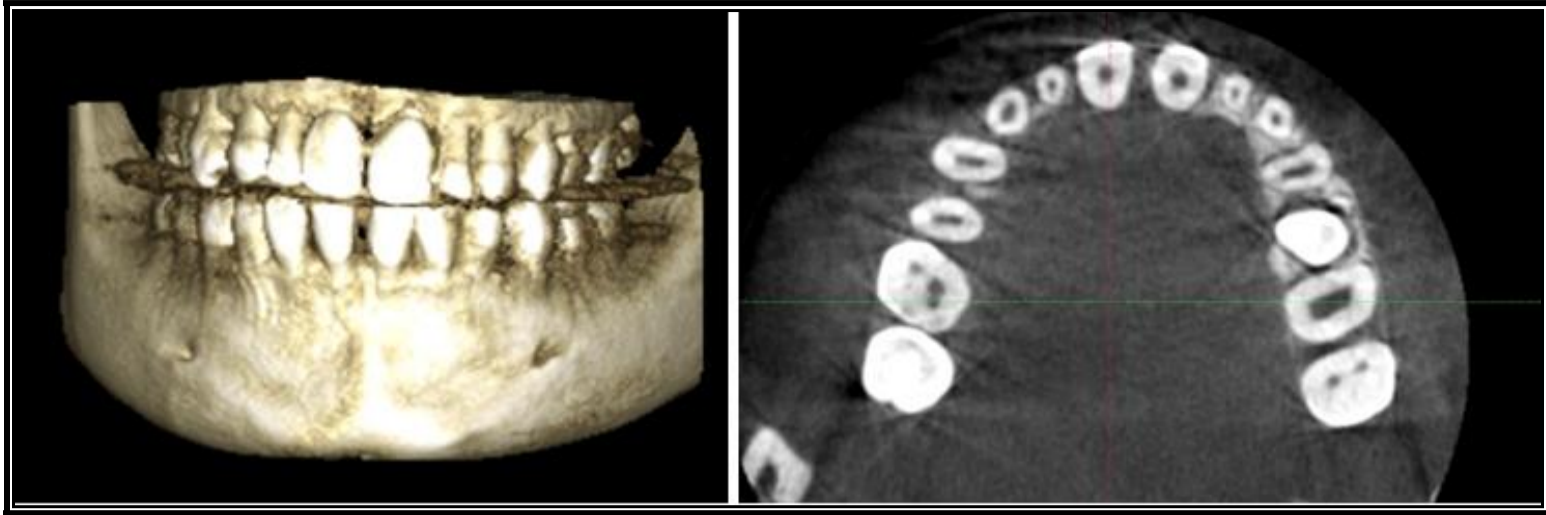


Figure.8 CBCT examination of the upper arch

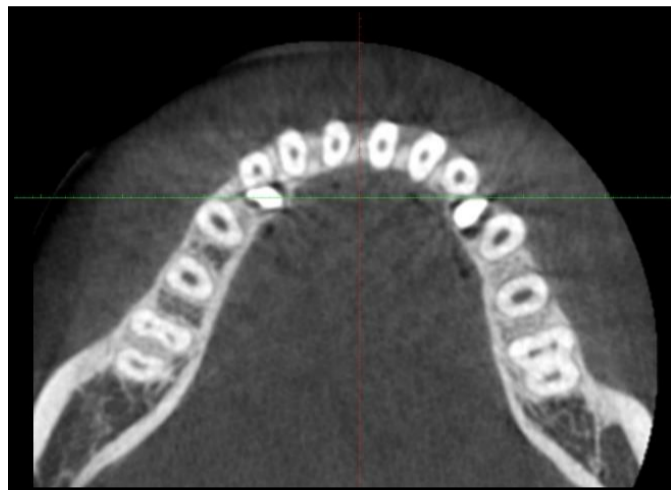


Figure 9: CBCT examination of the lower arch

The patient was monitored for approx. one year, but there were no significant resorption changes at the level of the roots of the temporary teeth - upper lateral incisors and upper canines, and a slight root resorption occurred only in the lower arch at the level of 73 and 83, i.e., in the temporary canines. It is worth mentioning that the subject's sister did not show any form of hypodontia.

The dental treatment plan conceived consisted of extracting the temporary lateral incisors and replacing them with two implant-prosthetic restorations after the completion of the facial growth. Considering the lifespan of the quick canines, the patient's age, and growth potential, it was decided to maintain teeth and replace them with implants only later. [9]. Another option considered is the replacement of temporary canines with upper first premolars to reduce the edentulous space. [10] It is recommendable to avoid inserting implants in the maxillary canine area due to the functional trauma in this area [10,11], but there were cases in which temporary canines were replaced with implants. [12]

As for the mandibular arch, it was decided to extract the temporary canines and direct the eruption of the permanent canines. The use of mini-implants would help close the spaces by mesialization of the lateral teeth.

Discussion

In temporary dentition, hypodontia is very rare, ranging between 0.1% and 2.4% [13,14,15], with females being more affected than males, i.e., a male: female ratio of 2:3. As regards the unilateral or bilateral missing of teeth, Endo et al. [11] reported that 89% of patients had bilateral missing teeth. The lateral incisor hypodontia

can be accompanied by diastema. In mixed dentition, the anomaly is suspected whenever the temporal lateral incisor persists, or eruption disorders occur with the premolar eruption before the lateral incisor, and the presence of a false diastema [12] Canine agenesis has been reported in sporadic cases, for example in a study conducted in India by Guttal et al. in 2010, Gupta et al. in 2011 and Shetty et al in 2012, no cases of agenesis of canine were reported. It may also be associated with other dental anomalies such as microdontia, supernumerary teeth, or other teeth missing malocclusions [13,14]. In other studies, the prevalence of canine agenesis ranges between 0.07 and 0.13% (Kambalimath et al., 2015) [15].

Treatment can sometimes be challenging to apply and requires interdisciplinary collaboration between the pediatric dentist, orthodontist, surgeon, and prosthetician. A key-role lies with the pediatric dentist, who has to evaluate the number of missing teeth and the number of temporary teeth remaining on the arch to plan the treatment. The presence of an associated abnormality, the degree of ingress, and the facial profile of the patient are other factors in making a therapeutic decision. If the roots of the teeth face root resorption problems, they can be extracted, and one may maintain the space by a space maintainer that will restore physiological and phonetic function until around the age of 20, when bridges or dental implants can be applied. In this situation, the option was to keep the temporary teeth in the arch and perform periodic dental checks to track root resorption. It is recommended to devitalize temporary teeth to maintain them longer on the hook. If root resorption occurs, it is possible to opt for extraction followed by implant prosthetic treatment.

Frequently, due to their location at the front of the arches, dental anomalies can create serious aesthetic and physiognomic problems in patients. Prosthetic treatment is the best solution from a physiognomic and durability point of view, but it can only be carried out after a certain age, given the loss of dental tissue for tooth preparation [14]. In children and adolescents, until the end of the growth period, which is considered at the age of 18 years, conservative, less invasive methods should be considered, often for a shorter period or even permanent [14].

Regarding frequency, studies have shown that the upper lateral incisor is the second missing tooth after the lower second premolar in the total number of missing teeth [15]. The absence of these teeth may be influenced by ethnicity, the age of the study group in the case of those with two missing teeth, and the size of the study sample [16].

Females were found to have a higher prevalence than males. The most commonly affected teeth were mandibular second premolars, maxillary lateral incisors, and maxillary second premolars. [17,18]

Regarding prevalence by sex, the prevalence was higher in women than in men (combined OR 1.22; 95% CI: 1.14, 1.30). Regarding teeth, the lower second premolar was the most common missing

tooth, followed by the upper lateral incisor and upper second premolar. [18,19]

Conclusions

Dental agenesis or anodontia is the congenital absence of the dental bud and, subsequently, the missing of the corresponding tooth on the arch, being one of the dental anomalies of number. To confirm diagnosis, the most crucial diagnosis used is CBCT, followed by the clinical examination. These cases require close collaboration between a pediatric dentist and a dental surgeon to find the best solution available in terms of treatment.

For the best possible treatment encompassing long-term results, there should be considered the underlying conditions of the patient, if applicable, the type of associated anomaly, the life span of the temporary teeth, the prosthetic reconstruction according to the patient's preferences, as well as treatment costs.

Conflict of Interests: The authors hereby represent that they have no conflict of interests to declare.

This authors contributed equally to this manuscript/work.

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