

## **A case report on congenitally absent bilateral maxillary primary and permanent lateral incisors**

### **ABSTRACT**

Hypodontia is uncommon in the deciduous dentition with a prevalence that ranges from 0.5% to 0.9%, with the maxillary lateral incisor being the most affected unilaterally or bilaterally. This paper reports a case of a 6 year old female with the chief complaint of missing teeth in the upper right and left tooth region. Thorough evaluation of the primary dentition visually and permanent dentition radiographically was done. There was missing 52 and 62, along with a lack of initiation of permanent successors 12 and 22 . The case was non-syndromic. Though several treatment options are available but the treatment planning depends on the evolution of the case. It requires extensive and complex treatments with early and prior identification of missing primary dentition anomalies that can guide the dentist to prevent future permanent dentition ailments and planning interceptive dental treatment at the appropriate time. At present the case is under follow up.

Key word : Maxillary, incisor, Dental Sciences

### **INTRODUCTION**

“Dental agenesis is one of the most common developmental anomaly in humans and is many a times associated with several other oral abnormalities. Hypodontia is uncommon in the deciduous dentition with a prevalence that ranges from 0.5% to 0.9%, with the maxillary lateral incisor being the most affected unilaterally or bilaterally”.<sup>(1)</sup> Grahnkn & Granath (1961) reported a 0.4% prevalence of hypodontia in deciduous dentition , and in subsequent studies Ravn (1971) , Jarvinen & Lehtinen (1981), Shilpa, G et al.(2017)<sup>(2)</sup> reported prevalences of 0.5%, 0.9% and 0.4 to 8.1% respectively. <sup>(3)</sup> Otsuchi T. et. al.,(2022)<sup>(4)</sup> concluded that “missing anterior deciduous teeth were predominantly found in the mandible, mostly in the deciduous mandibular lateral incisors, and more often on the right side than the left side”.

“ Although tooth agenesis is associated with more than 49 syndromes and both environmental and genetic factors that can cause a failure of tooth development”.<sup>(5)</sup>

“The presence of missing teeth in primary dentition can cause a lot of clinical problems like reduced alveolar development, decreased facial height, impairment of speech, deep bite and asymmetry of the affected side of face and is also associated with increased freeway space. The absence of a primary tooth is strongly correlated with increased prevalence of a missing successor”.<sup>(6)</sup>

Ravn J. et. al., (1973)<sup>(7)</sup> assessed that “out of 17 cases of agenesis of upper lateral incisors in the primary dentition 16 cases showed agenesis in the corresponding location in the permanent dentition”. Gellin M. et.al.,(1984)<sup>(8)</sup> found “similar associations between the two dentitions, as in 14 cases with agenesis of one primary lateral incisor, two cases had the succedaneous teeth present ,five cases had the corresponding permanent lateral incisor absent, and seven cases had agenesis of the corresponding permanent tooth and the bilateral tooth”.<sup>(9)</sup>

This present article aims to report the dental finding of congenital missing maxillary primary lateral incisor which is of rare occurrence.

## **CASE REPORT**

A 6 year old female patient reported to the Department of Pedodontics and Preventive Dentistry with a chief complaint of missing teeth in the right and left upper front region .The family and the medical history of the child patient regarding missing teeth was insignificant. On general examination , the child appeared healthy , well developed , well nourished with appropriate physical and mental growth for her age .No abnormality in the facial symmetry, skin, hair and nails was evident.

Intraoral clinical examination showed the presence of all primary teeth with missing maxillary left and right lateral incisors. There is no reported history of extraction of teeth. Thus, the maxillary arch revealed the asymmetry in the tooth number , with four teeth present on left and right side. The other teeth were of normal colour, size and shape.

## **INVESTIGATION**

Orthopantomogram radiograph was advised to get the complete view of upper and lower arch which confirmed the absence of primary maxillary right and left lateral incisor.

## **DISCUSSION**

“Tooth agenesis is defined as the congenital absence of teeth due to failure of tooth formation. Mutant mouse model studies showed that developmental arrest at the early stage of tooth development, usually the bud stage, leads to tooth agenesis and is clinically divided into hypodontia (one to six teeth missing), oligodontia (more than six teeth missing), and anodontia (all teeth missing), depending on the number of missing”.<sup>(10)</sup>

“Tooth agenesis is considered rare in the deciduous dentition and is not as common as in the permanent dentition”.<sup>(9)</sup> This case report presents a unique case of bilaterally missing lateral incisor in the maxillary region in a 3 year old female patient.

The congenital absence of missing teeth are associated with:

1. Environment factors

- Trauma, infection, radiation, chemotherapeutic medications, endocrine disturbances and severe intrauterine disturbances
- Somatic diseases like syphilis, rickets and scarlet fever.
- Associated syndromes like orofacial clefts, Downs syndrome (trisomy 21), Book syndrome, Coffin-Lowry syndrome, Goldenhar syndrome.
- “Dental anomalies such as enamel hypoplasia, taurodontism, delayed eruption, delayed tooth formation, prolonged retention of primary teeth, ectopic eruption, transposition, abnormal spacing of teeth and altered dimension of the associated gnathic regions”.<sup>(5)</sup>

2. Genetic Factors

- Regulatory homeobox genes found to be associated with tooth agenesis consists of Msx-1, Pax-9, EDA, TGFA, Axin-2.
- “Also a low density lipoprotein receptor related (LRP6) can cause tooth agenesis”.<sup>(5)</sup>

It may also arise from

- Physical obstruction or disruption of the dental lamina.
- Functional abnormalities of the dental epithelium.
- Failure of induction of the underlying mesenchyme<sup>(10)</sup>

Apart from this, Newman (1998) has given “four main theories mainly for the cause of agenesis of incisors. Heredity or familial distribution is the primary cause”. “A reduction in the dentition regarding as nature’s attempt to fit the shortened dental arches (an expression of evolutionary trend) and finally, localised inflammation or infections in the jaw and

disturbance of the endocrine system destroying the tooth buds”.<sup>(12)</sup> However, in the present case, no systemic factors/diseases/syndromes were obvious which could be responsible as a possible reason of the missing teeth.

“Radiographs must be taken at the earliest to confirm diagnosis of missing succedaneous teeth. Orthopantomogram is the x-ray of choice as suggested by Pilo et al., (1987) for an early diagnostic procedure in patients younger than 8 years”.<sup>(1)</sup>

“In the event of agenesis of a primary lateral incisor and its successor, the paradoxical frequency of a malpositioned maxillary permanent canine shows the importance these teeth have as the guiding tooth in the eruption of the canines. Maxillary canines have been believed to take the support of the root of the lateral incisor for guidance to erupt into the primary position. Hence its absence or malformation may result in deviation in its path”.<sup>(1)</sup>

According to Daugaard J et. al., (1997) “a more profound understanding of the aetiology of agenesis requires an extended analysis of the interrelation between agenesis in the primary and permanent dentitions”. “If, for instance, there is agenesis in the primary but not in the permanent dentition, the aetiological factor cannot be a defect in the down-growth of the dental lamina. If, on the other hand, there is agenesis in both dentitions, the condition may be due to an ectodermal mucosal defect”.<sup>(3)</sup>

It must be noted, however, that other studies by Nick-Hussein and Majid (1996), Canut-Brussola (2000), Daugaard-Jensen et al., (1997) have shown that “absence of a primary incisor is not always followed by that of the succedaneous tooth”.<sup>(13)</sup>

## **MANAGEMENT**

“Treatment of hypodontia requires multidisciplinary management to improve function and aesthetics. The treatment plan is sequenced in a way that it produces a long-term outcome”.<sup>(12)</sup> “A child with hypodontia or oligodontia should be under proper treatment planning, treatment, and coordination of treatment and review appointing. The general principle in management is to deal with the space within the dental arches, i.e., a space closure in less severe cases, while prosthetic replacements (in the form of dentures, crowns, bridges, auto transplantation, dental implants, etc.) as well as some orthodontic tooth movement in more severe cases”.<sup>(14)</sup>

“Treatment must be based on eruption pattern, growth potential, tooth position”.<sup>(12)</sup> “A prosthodontic rehabilitation, with a removable partial denture at an early stage which can be

modified according to the eruption status of the teeth and serve as an interim prosthesis and later rehabilitation of teeth with osseointegrated implants”.<sup>(14)</sup>

“Recently, an alternative treatment modality has been reported in which a zirconia-based resin bonded prosthesis is used to restore congenitally missing maxillary lateral incisors”.<sup>(5)</sup>

In cases of existing permanent successor teeth, it is advised to examine the child periodically in order to avoid possible space loss due to tipping of adjacent teeth toward the space created by the missing tooth. If space is already lost, it might be necessary to gain it back and then to use a space maintainer, till the permanent tooth is erupted.

Also in the case mentioned above, there is lack of initiation of 22 and 12. Further if at all it does not form and erupt in to the oral cavity, there is always a chance of mesial migration of which either the space will be closed by eruption of permanent canine (23,13) in the place of 22 and 12, which can be reshaped as an incisor or the space can be maintained for 22 and 12 and a fixed prosthesis can be given later.

“Management in cases of congenitally missing primary teeth will depend on the pattern and severity of tooth absence, the amount of spaces present, eruption pattern, growth potential, health of teeth and surrounding structures, occlusion and inter-occlusal space and the patient compliance. So, long-term follow-up of such cases is the utmost management plan to get a fruitful result”.<sup>(12)</sup>

## **CONCLUSION**

Hypodontia requires extensive and complex treatments with early and prior identification of missing primary dentition anomalies that can guide the dentist to prevent future permanent dentition ailments and planning interceptive dental treatment at the appropriate time.

### **Consent**

As per international standard or university standard, parents written consent has been collected and preserved by the author(s).

### **Ethical Approval:**

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).



**Fig 1 Frontal view of the case showing congenitally missing 52 and 62**



**Fig 2 Intraoral view showing congenitally missing 52 and 62**



**Fig 3 Orthopantomogram X-ray showing agenesis of primary and permanent maxillary lateral incisors.**



**Fig 4 Orthopantomogram X-ray showing agenesis of primary and permanent maxillary lateral incisors after 1 year follow up.**

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