

Case Report

***Corresponding author**
Vivek Mehta, MDS (Pedodontics)
Assistant Professor
Department of Pediatric and
Preventive Dentistry;
Faculty
Department of Dentistry
Jamia Millia Islamia, Jamia Nagar
New Delhi-110025, India
Tel. +91-9212024943
E-mail: drvivekmehta1@gmail.com

Article History:

Accepted: February 5th, 2024

Published: February 26th, 2024

Citation

Mehta V. A Case Report on Congenitally Missing Mandibular Second Premolars. *Dent Open J.* 2024; 11(1): 1-3.

Copyright

©2024 Mehta V. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

A Case Report on Congenitally Missing Mandibular Second Premolars

Vivek Mehta, MDS (Pedodontics)*

Department of Pediatric and Preventive Dentistry; Department of Dentistry, Jamia Millia Islamia, Jamia Nagar, New Delhi-110025, India

ABSTRACT

Congenitally missing teeth are a common developmental abnormality. It is defined as the developmental absence of teeth excluding the third molars. It is more commonly seen in permanent dentition but rarely in primary dentition. Second premolars are the most commonly missing teeth after the third molars. This paper reports a case of non-syndromic bilaterally congenitally missing second premolars in the mandibular region and its management.

KEYWORDS: Congenitally missing teeth; Mandibular region; Second premolars.

INTRODUCTION

Developmental alterations in the number of teeth that develop are common. Hypodontia denotes the lack of development of one or more teeth, oligodontia refers to six or more missing teeth, and anodontia to the complete absence of teeth. Hypodontia is common in permanent dentition as compared to primary dentition. According to Graber, the overall frequency of patients with congenitally missing teeth excluding the third molars has ranged from 1.6-9.6% in various studies in different countries.¹ Although any of the 32 permanent teeth may be missing but those most frequently missing in children are the mandibular second premolars, maxillary lateral incisors, and maxillary second premolars as confirmed in studies by Glenn² and Grahnen.³ Females are more often affected as compared to males with a predominance of 1.4:1.⁴ There is a close correlation between congenitally missing deciduous teeth and their permanent successors according to the study of Grahnen and Granath.³

Multifactorial etiology combining genetics, epigenetic and environmental factors has been suggested by Al Shahrani et al and Larmour et al.^{5,6} Regulatory homeobox genes found to be associated with tooth agenesis consist of MSX-1, PAX-9, EDA and AXIN-2.⁷ It may also be associated with some environmental insult during development. The presence of hypodontia may be associated with other dental anomalies such as small and short crowns and roots of the teeth that are present, conical crown shape, enamel hypoplasia, taurodontism, delayed eruption, prolonged eruption of primary teeth, infraocclusion of primary teeth, ectopic eruption, transposition, lack of alveolar bone, reduced vertical dimensions, increased overbite, and tooth impaction.⁸

A multidisciplinary approach may be indicated in the clinical management of problems associated with missing teeth.

The aim of the present article is to present a rare case report of congenitally missing bilateral mandibular second premolars in an adolescent patient and describe its management.

CASE REPORT

A twelve-year-old male reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of pain and discomfort in the lower left teeth region. Thorough intra-

oral examination showed presence of grossly carious mandibular primary first and second molar. The family and medical history of the child patient regarding missing teeth was insignificant (Figure 1). The other teeth were of normal color, size and shape. Intraoral periapical radiograph further revealed the absence of tooth buds of 35 and 45. Panoramic radiograph (OPG) revealed the absence of mandibular right and left second premolars along with absence of tooth buds of 18, 28, 38 and 48. (Figure 2)



Figure 1: Intraoral photograph showing retained deciduous mandibular left second molar and missing right second molar.



Figure 2: Panoramic view of bilateral agenesis of mandibular second premolars.

The mandibular second premolars were missing, thereby confirming that it was a case of congenitally missing teeth. The parents of the child patient gave no history of extraction, dental anomalies and consanguineous marriage. A thorough general examination was carried out to rule out the presence of any associated syndrome.

DISCUSSION

True anodontia or congenital absence of teeth can be found in almost any region of the dental arch and in both primary and permanent dentitions. According to the most accepted theory hypodontia is multifactorial and results from a combination of genetics and environmental influences.¹ True anodontia or congenital absence of teeth can be classified into two types, total and partial. Many cases of congenitally missing teeth have been reported in the literature, but this case report presents a unique case of management of bilaterally missing second premolars in the mandibular region without extraction.

Missing teeth are associated with trauma, infection,

radiation, chemotherapeutic medications, endocrine disturbances, and severe intrauterine disturbances.¹ Somatic diseases like syphilis, rickets and scarlet fever have also been associated with tooth agenesis.⁷ Tooth agenesis has been associated with a lot of syndromes and dental anomalies like orofacial clefts, Downs syndrome (trisomy 21), Book syndrome, Coffin-Lowry syndrome, Goldenhar syndrome, Ellis-van Creveld syndrome, Marshall-White syndrome, Johanson-Blizzard syndrome, Gorlin-Chaudhary-Moss syndrome, Progeria, Tooth-and-Nail syndrome, Witkop syndrome.^{1,7,8}

Recently it has been reported that tooth agenesis in humans is caused by mutations in gene encoding low-density lipoprotein receptor-related protein (LRP6).⁹

Hypodontia may lead to abnormal spacing of teeth, delayed tooth formation and deciduous tooth exfoliation, late permanent tooth eruption and altered dimension of the associated gnathic regions.⁸ Tooth agenesis can result in dental malpositioning, periodontal damage, and lack of development of maxillary and mandibular bone height.¹⁰

The treatment of congenitally missing mandibular premolars pose a challenge for the pediatric dentist as lot of therapeutic options are available with their innate advantages and disadvantages. Selection of the right treatment plan is of utmost importance for long term aesthetic results. Therapeutic options most commonly used to resolve the problem include either extraction of second deciduous molar or retention of the deciduous molar. Extraction of deciduous second molars can be planned if second premolars are missing due to pulpal pathology, crowding in permanent dentition, ankylosis and differences in tooth sizes between deciduous and permanent teeth.¹¹ However if crowding of teeth is associated with bilaterally congenitally missing second mandibular premolars, then the case can be managed with a multi-specialty approach in which deciduous second molars are sectioned, prepared for full coverage crown followed by correction with fixed orthodontics.¹² Hemisection or controlled slicing technique can also be used which is based on slicing the second primary molar and removing the mesial half allowing the mesial drift of the first permanent molar with less anterior tipping and loss of anchorage.¹³ Hemisection technique not only preserves the buccolingual ridge but also prevents the formation of a lateral buccal bony depression.¹⁴ It was also noted that late decisions on extraction or hemisection of second deciduous molars increased the likelihood of average to poor results.^{14,15}

A multidisciplinary approach can also be used to ensure functional occlusion and aesthetics at the same time. Genetic counselling may play an imperative role in children with multiple missing teeth.

In the present case the left deciduous second molar was retained and since the right deciduous molar was already extracted, the first permanent molar was allowed to drift mesially.

The child patient was kept under follow-up to observe the pattern of eruption of teeth.

CONCLUSION

Congenitally missing teeth is a dental anomaly with multifactorial etiology, occurring with greater frequency in females and in the permanent dentition. It can occur in both the maxilla and the mandible.

Retaining a deciduous mandibular second molar can be a viable treatment option in cases where anterior crowding is not present. As very few studies have been done regarding the risk factors and severity of congenitally missing teeth, future studies are recommended.

CONSENT

The patient has provided written permission for publication of the case details.

REFERENCES

- Graber LW. Congenital absence of teeth: Review with emphasis on inheritance patterns. *J Am Dent Assoc.* 1978; 96: 266-275. doi: [10.14219/jada.archive.1978.0054](https://doi.org/10.14219/jada.archive.1978.0054)
- Glenn FB. Numerical variations in primary dentition and their correlation with the permanent dentition. *J Dent Child.* 1964; 31: 269-270.
- Grahn H. Hypodontia in the permanent dentition. *Dent Abstr.* 1957; 3: 308-309.
- Cameron AC, Widmer RP. *Handbook of Pediatric Dentistry.* 3rd ed. PA, USA: Mosby Elsevier; 2012: 221.
- AlShahrani I, Togoo RA, AlQarni MA. A review of hypodontia: Classification, prevalence, etiology, associated anomalies, clinical implications and treatment options. *World J Dent.* 2013; 4(2): 117-125. Web site. <http://www.jaypeejournals.com/eJournals/ShowText.aspx?ID=4958&Type=FREE&TYP=TOP&IN=~eJournals/images/JPLOGO.gif&IID=381&isPDF=YES>. Accessed April 24, 2016
- Larmour CJ, Mossey PA, Thind BS, Forgie AH, Stirrups DR. Hypodontia: A retrospective review of prevalence and etiology. *Part I Quintessence Int.* 2005; 36: 263-270. Web site. <http://www.ncbi.nlm.nih.gov/pubmed/15835422>. Accessed April 24, 2016
- Galluccio G, Castellano M, Monaca CL. Genetic basis of non-syndromic anomalies of human tooth number. *Arch Oral Biol.* 2012; 57(7): 918-930. Web site. <https://www.clinicalkey.com/#!/content/journal/1-s2.0-S0003996912000167>. Accessed April 24, 2016
- Cobourne MT. Familial human hypodontia: Is it all in the genes? *Br Dent J.* 2007; 203(4): 203-208. doi: [10.1038/bdj.2007.732](https://doi.org/10.1038/bdj.2007.732)
- Ockeloen CW, Khandelwal KD, Dreesen K, et al. Novel mutations in LRP6 highlight the role of WNT signalling in tooth agenesis. *Genet Med.* 2016. doi: [10.1038/gim.2016.10](https://doi.org/10.1038/gim.2016.10)
- Silva Meza R. Radiographic assessment of congenitally missing teeth in orthodontic patients. *Int J Paediatr Dent.* 2003; 13(2): 112-116. doi: [10.1046/j.1365-263X.2003.00436.x](https://doi.org/10.1046/j.1365-263X.2003.00436.x)
- Valencia R, Saadia M, Grinberg G. Controlled slicing in the management of congenitally missing second premolars. *Am J Orthod Dentofacial Orthop.* 2004; 125: 537-543. doi: [10.1016/j.ajodo.2003.05.009](https://doi.org/10.1016/j.ajodo.2003.05.009)
- Jha P, Jha M. Management of congenitally missing second premolars in a growing child. *J Conserv Dent.* 2012; 15(2): 187-190. Web site. <http://www.jcd.org.in/article.asp?issn=0972-0707;year=2012;volume=15;issue=2;spage=187;epage=190;aulast=Jha>. Accessed April 24, 2016
- Bjerklin K, Al-Najjar M, Kårestedt H, Andrén A. Agenesis of mandibular second premolars with retained primary molars. A longitudinal radiographic study of 99 subjects from 12 years to adulthood. *Eur J Orthod.* 2008; 30: 254-261. doi: [10.1093/ejo/cjn027](https://doi.org/10.1093/ejo/cjn027)
- Sunitha VR, Emmadi P, Namasivayam A, Thyegarajan R, Rajaraman V. The periodontal - endodontic continuum: A review. *J Conserv Dent.* 2008; 11: 54-62. Web site. <http://www.jcd.org.in/article.asp?issn=0972-0707;year=2008;volume=11;issue=2;spage=54;epage=62;aulast=Raja>. Accessed April 24, 2016
- Uner O, Yucel-Eroglu E, Karaca I. Delayed calcification and congenitally missing teeth. Case report. *Aust Dent J.* 1994; 39: 168-171. doi: [10.1111/j.1834-7819.1994.tb03087.x](https://doi.org/10.1111/j.1834-7819.1994.tb03087.x)