

Non-syndromic non-familial agenesis of incisors: A series of two cases

Shiva Gupta^{1,*}, Ritika Arora², Sachin Gupta³

^{1,3}PG Student, ²Lecturer, Dept. of Periodontology, Subharti Dental College, Meerut, Uttar Pradesh

***Corresponding Author:**

Email: guptashiva1892@gmail.com

Abstract

Congenital absence of fewer than six teeth excluding third molars is termed as tooth agenesis or hypodontia. Agenesis of one or more teeth is considered the most common anomaly of tooth development. Absence of central or lateral incisor creates an aesthetic problem which can be managed in several ways. The aim of the present paper is to report clinical cases of congenital missing permanent maxillary and mandibular incisors and its clinical implications and treatment options.

Keywords: Aesthetics, Agenesis, Congenital, Hypodontia, Missing incisors.

Introduction

Aesthetics is an important factor and problems related to it might affect patient's self-esteem, communication behaviour, professional performance and quality of life.⁽¹⁾ Dental agenesis, congenitally missing teeth (CMT) or congenital dental aplasia is one of the most common anomaly of tooth development, which may negatively affect both the aesthetics and function.⁽²⁾ As patients with missing permanent teeth may suffer from complications such as malocclusion (which itself can lead to mastication problems), periodontal damage, lack of alveolar bone growth, reduced chewing ability, inarticulate pronunciation, changes in skeletal relationships and an unfavourable appearance, most of these conditions need costly and challenging multidisciplinary treatments.⁽³⁾ CMT may be considered as hypodontia that is agenesis of fewer than six teeth excluding third molars or oligodontia which is agenesis of more than six teeth excluding third molars.⁽⁴⁾ Certain factors responsible for agenesis are genetic, environmental, trauma or infection.⁽⁵⁾ Oligodontia is a rare condition that can occur with genetic syndromes or as a non-syndromic isolated familial trait or as a sporadic finding.⁽⁴⁾ The most frequently missing teeth are third molars followed by mandibular second premolars (2.8%), maxillary lateral incisors (1.6%), maxillary second premolars and mandibular incisors (0.23%-0.08%).⁽⁶⁾ An important key factor in providing successful treatment to patients with hypodontia is the interdisciplinary intervention, that involves the close work of a committed team (general dental practitioner, pediatric dentist, orthodontist), where each member contributes with a different expertise to achieve optimal results for the patient.⁽⁷⁾ The purpose of this article is to present two cases of agenesis of maxillary and mandibular incisors.

Case Report 1

A 23 year old male patient reported to the Department of Periodontology, Subharti Dental College and Hospital, Meerut with a chief complaint of yellow

teeth with calculus deposits and unpleasant appearance in upper front tooth region. Intraoral examination revealed generalized spacing in maxillary anterior tooth region due to missing right and left permanent lateral incisors.(Fig. 1) However, complete permanent dentition was observed in the mandibular arch. There was no history of any severe systemic diseases, trauma or infections to the anterior region. Family history revealed no such finding in any members of the family. Panoramic examination confirmed the bilateral agenesis of permanent maxillary lateral incisors.



Fig. 1: Congenitally missing lateral incisors 12 and 22

Case Report 2

A 16 year old female patient reported to the Department of Periodontology, Subharti Dental College and Hospital, Meerut with a chief complaint of mobile lower anterior teeth. On intraoral examination maxillary arch was intact with permanent dentition, however, there was presence of retained deciduous mandibular central incisor with grade I mobility in the lower anterior tooth region.(Fig. 2) Class I molar relation with deviated midline was observed. No significant family history could be revealed neither the patient had any systemic or traumatic involvement. Panoramic radiograph showed congenital absence of permanent mandibular central incisor. Extraction of retained

mobile deciduous central incisor was planned, followed by fixed prosthetic replacement of the missing tooth.



Fig. 2: Retained deciduous 71 and congenitally missing 31

Discussion

Anomalies in tooth number, size, shape and structure may lead to certain developmental dental disorders which may result from disturbances during initiation, morph differentiation of tooth germs, apposition of hard dental tissues and during eruption of teeth. Several factors like traumatic injury, chemotherapy or radiation, infection, metabolic disorders and endocrine disturbances are the possible etiologic factors of agenesis.⁽⁸⁾ As the exact cause behind the congenital absence of incisors is not clear, therefore, certain hypothesis have been made to explain the etiology of agenesis of incisors.⁽⁹⁾ First cause is heredity or familial distribution. Disturbances in the interaction of genetic factors like MSX1 and PAX9 are associated with congenitally missing incisors. Secondly, disturbances in the development of the mandibular symphysis that may affect the tissues forming the tooth buds.⁽¹⁰⁾ Thirdly, a reduction of the dentition regarded as nature's attempt to fit the shortened dental arches⁽¹¹⁾ and lastly, disturbance of the endocrine system and localized inflammation or infections in the jaw that affects the tooth buds.⁽¹²⁾ Hypodontia is also often seen in syndromes, particularly in those which present with other ectodermal anomalies and in non-syndromic patients with cleft lip/ alveolus with or without cleft palate.⁽¹³⁾ In such cases multidisciplinary treatment plan should be considered to restore aesthetics and function. The literature describes two treatment options for congenitally missing incisors: space closure with mesial repositioning of the canine, followed by tooth re-contouring; or space opening followed by placement of a prosthesis, transplant or dental implant.^(13,14) Radiographic examination is necessary in order to see the exact position of the root. To help dentists plan for these situations, a number of studies have assessed the results of the different treatment options.⁽¹⁵⁻²¹⁾ However, no studies could be found comparing the occlusal and

periodontal status in patients treated with either space closure plus tooth re-contouring or with implants.

Conclusion

Dental agenesis leads to clinical and public health problem, as patients in these conditions may suffer from reduced masticatory capacity, malocclusions, phonological problems, and compromised esthetics. Hence, establishing the aesthetics and masticatory function is prime concern in the patients with congenital absence of permanent central and lateral incisors. In management of such cases of hypodontia multidisciplinary treatment planning is required which might involve orthodontics, esthetic dentistry, implantology and prosthodontics. Constant interaction and communication among the team members and the patient at all levels of treatment is the key to success of the interdisciplinary treatment.

References

1. Meaney S, Anweigi L, Ziada H, Allen F. The impact of hypodontia: A qualitative study on the experiences of patients. *Eur J Orthod.* 2012;34:547-52.
2. Goya HA, Tanaka S, Maeda T, Akimoto Y. An orthopantomographic study of hypodontia in permanent teeth of Japanese pediatric patients. *J Oral Sci.* 2008;50:143-50.
3. Khosravanifard B, Ghanbari-Azarnir S, Rakhshan H, Sajjadi SH, Ehsan AM, Rakhshan V. Association between orthodontic treatment need and masticatory performance. *Orthodontics (Chic)* 2012;13:20-8.
4. Kotsiomi E, Kassa D, Kapari D. Oligodontia and associated characteristics: assessment in view of prosthodontic rehabilitation. *Eur J Prosthodont Restor Dent* 2007;15:55-60.
5. Nagaveni NB, Umashankara KV. Congenital bilateral agenesis of permanent mandibular incisors: case reports and literature review. *Arch Orolfac Sci* 2009;2:41-46.
6. Cameron J, Sampson WJ. Hypodontia of the permanent dentition. Case reports. *Aust Dent J* 1996;41:1-5.
7. Nunn JH, Carter NE, Gillgrass TJ, Hobson RS, Jepson NJ et al. The interdisciplinary management of hypodontia: background and role of paediatric dentistry. *Br Dent J* 2003;194:245-251.
8. Endo T, Ozoe R, Kubota M, Akiyama M and Shimooka S. A survey of hypodontia in Japanese orthodontic patients. *Am J Orthod Dentofacial Orthop* 2006;129:29-35.
9. Newman GV. Transposition: orthodontic treatment. *J Am Dent Assoc* 1977;94:544-547.
10. Kim JW, Simmer JP, Lin BP, Hu JC. Novel MSX1 frameshift causes autosomal-dominant oligodontia. *J Dent Res* 2006;85:267-271.
11. Pereira TV, Salzano FM, Mostowska A, Trzeciak WH, Ruiz-Linares A et al. Natural selection and molecular evolution in primate PAX9 gene, a major determinant of tooth development. *Proc Natl Acad Sci USA* 2006;103:5676-5681.
12. Van den Boogaard MJ, Dorland M, Beemer FA, van Amstel HK. MSX1 mutation is associated with orofacial clefting and tooth agenesis in humans. *Nat Genet* 2000;24:342-343.
13. Ram MK, Karunakaran A, Laxmi M KS, Kumara EA. Congenitally missing permanent mandibular incisors: a case report. *Int J Oral Care Res* 2014;2:32-34.

14. Rakhshan V. Congenitally missing teeth (hypodontia): A review of the literature concerning the etiology, prevalence, risk factors, patterns and treatment. *Dent Res J* 2015;12:1-13.
15. Carlson H. Suggested treatment for missing lateral incisor cases. *Angle Orthod* 1952;22:205-216.
16. McNeill RW, Joondeph DR. Congenitally absent maxillary lateral incisors: treatment planning considerations. *Angle Orthod* 1973;43:24-29.
17. Nordquist, GG, McNeill, RW. Orthodontic vs restorative treatment of congenitally absent lateral incisors - long term periodontal and occlusal evaluation. *J Periodontol* 1975;46:139-143.
18. Robertsson S, Mohlin B. The congenitally missing upper lateral incisor. A retrospective study of orthodontic space closure versus restorative treatment. *Eur J Orthod* 2000;22:697-710.
19. Rosa M, Zachrisson BU. Integrating esthetic dentistry and space closure in patients with missing maxillary lateral incisors. *J Clin Orthod* 2007;41:563-573.
20. Rosa M, Zachrisson BU. The space-closure alternative for missing maxillary lateral incisors: an update. *J Clin Orthod* 2010;44:540-549.
21. Zachrisson BU, Rosa M, Toreskog S. Congenitally missing maxillary lateral incisors: canine substitution. *Am J Orthod Dentofacial Orthop* 2011;139:434-445.