Mandibular hypo-hyperdontia: A report of three cases

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Abstract

Dental anomalies of tooth number in development of the permanent dentition are quite common than the primary dentition, however, the combined occurrence of hypodontia and hyperdontia is a rare phenomenon, especially in the same dental arch. The purpose of this report is to describe a case of concomitant hypo-hyperdontia (CHH) in three patients (one girl and two boys) with missing mandibular central incisor and an erupted mandibular mesiodens. Three rare cases of mandibular CHH were observed during routine examination, where the two anomalies manifested in the anterior region of the mandible. Furthermore, these are the only cases exhibited taurodontism in association with mandibular CHH.

Key words: Hyperdontia, hypodontia, taurodontism

INTRODUCTION

Agenesis of one or more teeth in primary or permanent dentition is known as hypodontia, while, hyperdontia is a condition that of having extra to the normal complement of teeth. Hypodontia and hyperdontia are two extremes in the development of the dentitions. The occurrence of both these identities in the same individual is a form of combined numeric variation. Although, the existing literature shows exclusively either hyperdontia or hypodontia, however, only a few studies have been accounted the incidence of both the anomalies.¹² The term “concomitant hypo-hyperdontia” (CHH) has been used to describe the occurrence in the same individual.³

The aetiology of CHH remains unclear and it is not evidently documented in the literature. While, environmental and genetic factors have been anticipated to explain the occurrence of these anomalies. Furthermore, CHH has been reported in patients with Down syndrome, Dubowitz syndrome, Ellis-van Creveld syndrome, fucosidosis, G/BBB syndrome, Marfan syndrome and cleft lip and palate.⁴

The reported prevalence was between 0.002% and 3.1%, most of these were of CHH involved both the arches.¹ Most of these cases were identified accidentally and/or regular examination. Most recently, it has been reported by several authors the combination of both hypodontia and hyperdontia in both arches. The occurrence of CHH in the same dental arch in a healthy patient is most likely to be a rare phenomenon and all existing reports are reported in the maxilla.¹,⁴,⁵ The occurrence of CHH in the mandibular arch is extremely rare, however, most recently few cases has been reported on this identity involving congenitally missing both central incisors. The purpose of this article is to review the literature and to describe three rare identities of CHH in the anterior region of the mandibular arch.

CASE REPORTS

This was a case report of three patients (one female and two males) attended to the Department of Pedodontics and Preventive Dentistry as regular walk-in patients. Medical histories and family histories were unremarkable and all patients were full term babies born to parents of a non-consanguineous

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There was no history of infection, metabolic disorders and trauma, in their childhood. All our patients were attended 1st time to our dental clinic for examination, among these one patient (female) received restorations by a private dentist. Intra-oral examination revealed that all our patients were in mixed dentition. Oral hygiene was adequate, absence of the mandibular central incisor tooth 41 and presence of a microdontic tooth in the midline was evident which was conical in shape [Figure 1 (Case 1) and Figure 2 (Case 2)]. The normal morphology of the clinical crowns of the three incisors was evident. On radiographic examination, the panoramic radiographs revealed that the conical shaped tooth was with complete root formation and no periapical changes were evident [Figures 3-5]. Based on its appearance and size it was diagnosed as supernumerary tooth (SNT). Taurodontism was evident in permanent first molars of two patients. Other findings were normal considering the patients age. The approximation of the roots of the SNT and incisors, no spacing was present in between the incisors which highlighted the absence of the incisor in all three cases. Both clinical and radiographic examinations revealed that the absence of tooth 41 and the presence of a SNT in the tooth 41 region. The diagnosis of mandibular CHH was made in three case based on the history, clinical and radiological investigations. All the patient parents were informed and options were given for the management of conical shape SNT. The options that were considered were composite restoration, single unit crown and resin-bonded bridge on the short-term basis and implants followed by extraction on long-term. The patients underwent a complete physical examination to evaluate the syndromic features that were not identified. Esthetics were given priority and the patients were advised rehabilitation for the anterior teeth spacing; however, two (Case 2 and 3) of patients refused any intervention and was satisfied with their current dentition. One patient (Case 1) gone through scaling and restorations for the mandibular first permanent molars and he has been kept under review.

**DISCUSSION**

Gibson[6] divided hypo-hyperdontia as pre-maxillary, maxillary, mandibular and bi-maxillary hypo-hyperdontia based on the site of occurrence. The three cases described in this article are good examples of mandibular CHH excluding the third molars in both the arches. Garn et al.[7] have discussed the association of third molar agenesis with missing teeth from other classes of teeth. The authors concluded that the association among the reduction in the number of other teeth and third molars hysteresis the hypothesis of a field of variable intensity, which, in its greatest degree of expression, eliminates all four third molar teeth. The distribution of missing third molars in the present report was teeth 18 and 28 (Case 1), 18, 28 and 48 (Case 2) and tooth 18 (Case 3) accordingly, if, third molars were taken in to account these cases were considered as bi-maxillary CHH.

Several hypothesis, including atavism, dichotomy, hyperactivity of the dental lamina and the concept of multi-factorial inheritance, have been proposed to elucidate the formation of SNT that are common in males. Similarly, several theories have been propagated on the tooth agenesis; the conception of a polygenic multi-factorial model of etiology still provides a good explanation for hypodontia, which is common in females[1]. However, the etiology of
CHH remains unclear. Additionally, there is no family history in three cases was evident, it has been recommended that disturbances in differentiation, migration and proliferation of neural crest cells was associated with interactions between the epithelial and the mesenchymal cells during the initiation of odontogenesis may be responsible for CHH.\[1-3\] A recent study from Poland reported that CHH is rare and sex-related, with a predominance of hypodontia.\[8\]

SNT may be single or multiple, unilateral or bilateral in distribution, can occur in both dental arches and either in the primary mixed or permanent dentitions. The mesiodens in maxillary arch are the most commonly occurring SNT type followed by mandibular supplemental premolars\[9\]. Contrarily, the cases in the report exhibited SNT in the anterior region of the mandible. Occurrence of SNT in the mandibular anterior region is exceedingly rare condition, but when they do occur, they appear as one or more smaller cone-shaped teeth.

Excluding third molars mandibular second premolars were the most commonly missing in Caucasian population, whereas, mandibular incisors in Asian populations\[10\]. It has also been reported that the unilateral form of missing teeth were more common. Similarly, in three cases one mandibular incisor was missing congenitally.

Most recently Zadurska et al.\[5\] reported that the occurrence of CHH in both jaws or in the maxilla and the authors stated that CHH never occur only in the mandible. Nevertheless, this condition in mandibular anterior region has been reported\[2,8,11-16\] [Table 1], where both mandibular central incisors were missing with the presence of SNT in the midline. In contrast, in present cases only one mandibular central incisor was missing with the presence of a SNT. Therefore, it is surprising to note that occurrence of agenesis of unilateral central incisor exhibited in all cases with the presence of SNT. This concurs with the reported findings that a SNT seldom approaches or equals normal tooth size and shape, microdontic and conical shaped mandibular incisors are extremely rare.

Taurodontism has been frequently reported with the incidence rate of 0.25% and 18\%\[17\]. Several authors have studied the association among taurodontism and hypodontia. Seow and Lai\[18\] reported 34.8\% of patients affected by hypodontia had taurodontism while Gomes et al.\[19\] found one-third of their patients. It has been reported that taurodontism has been associated with CHH; similarly, in the present report two of our patients with CHH exhibited taurodontism in maxillary first permanent molars. Furthermore, most recently densevaginatus\[21\] and double tooth\[22\] have been reported in association with CHH.

The standard treatment protocols have not been discussed for the management of CHH in literature and a multidisciplinary approach is necessary; hence, the management of CHH is quite challenging. In the present scenario, no treatment, extraction of mesiodens and close
the space with fixed orthodontics, extraction of mesiodens and Maryland bridge as short-term and implants in feature and composite build-up to mimic as incisor, were treatment options included. Among our patients two were declined the treatment and one patient received treatment. It was decided to have aesthetic restoration for the mandibular anterior region. Early diagnosis is a key for the successful management, since it permits the dentist to implement the most appropriate treatment options for the patient to minimize consequences. The treatments may differ from individual to individual.

The diagnosis of CHH in all our cases was only an incidental finding, which is similar to most of the findings that have been reported. Moreover, it has been stated that a high proportion of patients with CHH may remain undiagnosed in the population. The cases in the present report created a dilemma for the first instance in a clinical scenario and it is very difficult to diagnosis the CHH in a growing child. Our three cases exhibited mesiodens in tooth 41 region, which was coincidental and the size and shape of the tooth in 41 regions was completely different than usual appearance of mandibular central incisor. The panoramic evaluations of these cases confirm the findings. Clinical examination along with radiographic evaluation drew the proper diagnosis of the dilemma in our cases. It has also been suggested that the use of radiograph along with the clinical examination may enhance the recognition of CHH which probably could modify in the treatment plan.

**CONCLUSION**

CHH is an unusual condition and occurrence in the mandibular arch is extremely rare. Moreover, this condition which might be diagnosed by routine clinical and radiographic examinations. Agenesis of unilateral mandibular incisor, with the presence of SNT in the anterior region of the mandible is extremely rare. The present cases are unique cases of mandibular CHH. Furthermore, taurodontism associations with CHH have been evident, which needed further discussion.

**REFERENCES**

1. Anthonappa RP, Lee CK, Yiu CK, King NM. Hypohyperdontia: Literature review and report of seven cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008;106:e24-30.
2. Nuvvula S, Kiranmayi M, Shilpa G, Nirmala SV. Hypohyperdontia: Agenesis of three third molars and mandibular centrals associated with midline supernumerary tooth in mandible. Contemp Clin Dent 2010;1:136-41.
3. Camilleri GE. Concomitant hypodontia and hyperdontia. Case report. Br Dent J 1976;142:338-9.
4. Mallineni SK, Jayaraman J, Yiu CK, King NM. Concomitant occurrence of hypohyperdontia in a patient with Marfan syndrome: A review of the literature and report of a case. J Investig Clin Dent 2012;3:253-7.
5. Zadurska M, Sieminska-Piekarczyk B, Maciejak D, Wyszomirska-Zdybel B, Kurol J. Concomitant hypodontia and hyperdontia: An analysis of nine patients. Acta Odontol Scand 2012;70:154-9.
6. Gibson AC. Concomitant hypo-hyperdontia. Br J Orthod 1979;6:101-5.
7. Garn SM, Lewis AB, Vicinus JH. Third molar polymorphism and its significance to dental genetics. J Dent Res 1963;42:Suppl 134-64.
8. Nayak AG, Chhaparwal Y, Pai KM, Lele AS. Non-syndromic hypo-hyperdontia of the permanent dentition with involvement of the mandibular anterior region: a rare occurrence. Rev Clin Pesq Odontol 2010;6:281-4.
9. Mallineni SK. Radiographic localization of supernumerary teeth in the maxilla. [MDS Thesis] Hongkong University of Hong Kong; 2011.
10. Polder BJ, Van’t Hof MA, Van der Linden FP, Kuijpers-Jagtman AM. A meta-analysis of the prevalence of dental agenesis of permanent teeth. Community Dent Oral Epidemiol 2004;32:217-26.
11. Low T. Hypodontia and supernumerary tooth: Report of a case and its management. Br J Orthod 1977;4:187-90.
12. Das G, Sarkar S, Bhattacharya B, Saha N. Coexistent partial anodontia and supernumerary tooth in the mandibular arch: A rare case. J Indian Soc Pedod Prev Dent 2006;24 Suppl 1:S33-4.
13. Verma KG, Verma P, Rishi S. Case report: A rare occurrence of non-syndromic hypo-hyperdontia in the mandibular anterior region. Eur Arch Paediatr Dent 2012;13:47-9.
14. Raghavan VH. Mandibular mesiodens with agenesis of central incisors-A rare association. Niger Dent J 2009;17:27-8.
15. Venkatagghavan K, Muralkrishnan B, Anantharaj A. Mandibular mesiodens with agenesis of central incisors (Hypohyperdontia): A case report and review. Int J Contemp Dent 2011;2:26-30.
16. Marya CM, Sharma G, Parashar VP, Dahiya V, Gupta A. Mandibular midline supernumerary tooth associated with

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**Table 1: Details of the three cases presented with mandibular hypo-hyperdontia along with published cases**

| Author, year | Gender | Hypodontia | Hyperdontia |
|--------------|--------|------------|-------------|
| Low, 1977(1) | Male   | 31, 41     | Mesiodens   |
| Das et al., 2006(2) | Female | 31, 41     | Mesiodens   |
| Raghavan 2006(3) | Female | 31, 41     | Mesiodens   |
| Nuvvula et al., 2010(4), Venkatagghavan et al., 2011(5) | Present cases | Male | 31, 41 | Mesiodens |
| Nasha et al., 2010(6) | Male | 31, 41 | Mesiodens |
| Verma et al., 2012(7) | Male | 31, 41 | Mesiodens |
| Marya et al., 2012(8) | Male | 31, 41 | Mesiodens |

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agénésie des incisives centrales permanentes: un dilemme diagnostique. Stomatologija 2012;14:65-8.
17. Ruprecht A, Banniji S, el-Neweihi E. L'incidence de la taurodontisme dans les patients dentaires. Oral Surg Oral Med Oral Pathol 1987;63:743-7.
18. Seow WK, Lai PY. Association of taurodontism with hypodontia: A controlled study. Pediatr Dent 1989;11:214-9.
19. Gomes RR, da Fonseca JA, Paula LM, Faber J, Acevedo AC. Prevalence of hypodontia in orthodontic patients in Brasilia, Brazil. Eur J Orthod 2010;32:302-6.
20. Nirmala SV, Mallineni SK, Nuvvula S. Pre-maxillary hypo-hyperdontia: Report of a rare case. Rom J Morphol Embryol 2013;54:443-5.
21. Manjunatha BS, Nagarajappa D, Singh SK. Concomitant hypo-hyperdontia with dens invaginatus. Indian J Dent Res 2011;22:468-71.
22. Sharma A. Concomitant hypo-hyperontia: Report of two cases. Indian J Dent Res 2012;23:700.

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