

Developmental Numerical Anomalies in Teeth in Non-Syndromic individuals: Report of two cases.

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ABSTRACT

Two cases reported with the complaint of the presence of double teeth. Clinical and radiographic examination revealed a numerical developmental anomaly, a unilateral supernumerary tooth, mesiodens, and agenesis of bilateral permanent mandibular central incisors in the same segment in addition with agenesis of bilateral mandibular second molar and left second premolar in first case and in second case permanent mandibular left central incisor was missing along with unilateral mesiodens. To our knowledge, there are very few reports of the simultaneous occurrence of partial anodontia or hypodontia, congenital absence of teeth, and supernumerary teeth or hyperdontia an excess number of teeth present in the same individual.

Keywords: Hypodontia, hyperdontia, developmental anomaly.

INTRODUCTION

A number of physiologic growth processes participate in the progressive development of teeth. Anomalies of teeth follow patterns that reflect the time in development when malformations occur. Alterations in tooth number result from hereditary patterns, problems during the initiation (disturbance in ectomesenchymal-epithelial interaction) or



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dental lamina stage (physical disruption of dental lamina, overactive dental lamina, and failure of dental lamina induction by ectomesenchyme).^{1,2} Hypodontia, microdontia, supernumerary teeth, and macrodontia are associated. Brook³ attempted to unify the etiologic explanation for these associations by proposing a multifactorial hypothesis with the genetic and environmental component.³ According to Viera *et al.*,⁴ MSX1, TGFA and PAX9 interaction sometimes seem to play a role in tooth agenesis.

The simultaneous occurrence of partial anodontia or hypodontia, congenital absence of teeth, and supernumerary teeth or hyperdontia an excess number of teeth present in the same individual is a very rare condition and is termed as concomitant hypo-hyperdontia (CHH). It has been found more often in the permanent dentition than in the primary or mixed dentition.⁵ Most of the reported cases are in the maxillary arches. Varela *et al.*⁶ reported prevalence of 0.33% for CHH in a survey.

Case reports of concomitant hypodontia with hyperdontia in Indian population are few. Simultaneous presence of multiple supernumerary teeth and a missing tooth (canine) without any associated systemic conditions or syndromes involving both jaws was reported by Sharma in 2001.⁷ Bilateral presence of two tuberculate mesiodentes in maxillary anterior segment and missing maxillary left second premolar was reported by Sharma.⁸ A single supernumerary teeth in midline and agenesis of both mandibular central incisors has been reported by Das.⁹ Manjunath¹⁰ reported absence of mandibular central incisor with presence of supplemental supernumerary teeth in maxilla in form of lateral incisor.

The first case shows agenesis of bilateral permanent mandibular second molar, left second premolar and permanent mandibular central incisors with the presence of unilateral supernumerary teeth (hypo-hyperdontia) which has never been reported in the literature as per our knowledge. The second case shows agenesis of permanent mandibular left central incisor and unilateral mesiodens.

CASE REPORT

Case 1

A 9 year old female reported to the Department of Pedodontics and Preventive Dentistry with the complaint of

the presence of double teeth. Both child and parent were unaware of any trauma to the teeth or jaws or any perinatal infection suffered by child or mother. Also, there was no family history of dental anomalies in the child's parents or siblings. Her medical history was unremarkable.

No abnormality was noted during the general physical / extraoral examination. Physical growth was within normal limits. The patient was normal in stature, appearance, height, and weight for her age. Limbs, hands, skin, hair, nails and eyes appeared normal on examination. No abnormality was observed in neck, back, muscles, cranium and joints as well. Intellectual and scholastic performance was also normal. Intraoral examination revealed mixed dentition with a single lingually erupting mesiodens in relation to 81 and there was retained 71, 81 and 82 and caries in 84 (Fig. 1). An orthopantomogram X-ray was advised for radiographic evaluation of clinical impressions. Investigation: Radiographic examination revealed absence of both permanent mandibular second molar and left second premolar (Fig. 2). The orthopantomogram was not clear in the lower anterior region and hence IOPA X-ray was taken which revealed the absence of both permanent mandibular central incisors and presence of a single conical tooth, mesiodens, with incomplete root formation (Fig. 3).

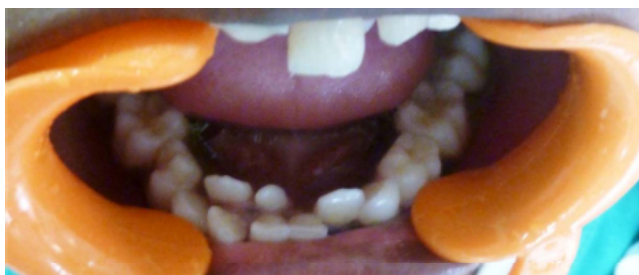


Figure 1: Intra oral view (Case 1)

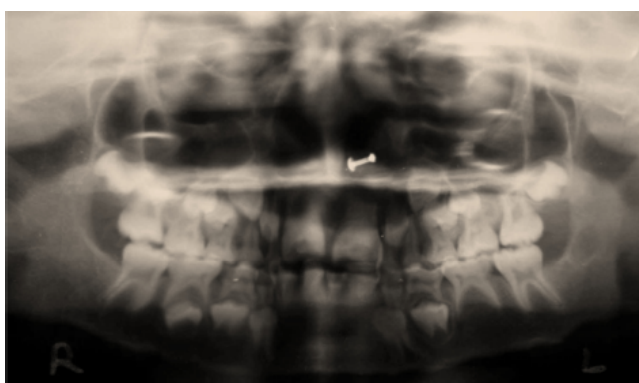


Figure 2: Orthopantomogram (Case 1)

Case 2

A 12 year old male reported to the Department of Pedodontics and Preventive Dentistry with the complaint of the presence of double teeth. No abnormality was noted



Figure 3 : Intraoral radiograph of mandibular anterior segment (Case 1)

during the general physical / extraoral examination. Physical growth was within normal limits. Intraoral examination revealed permanent dentition with a single lingually erupting mesiodens in relation to 32 and 41 and there was missing permanent 31 (Fig. 4). IOPAX-ray was advised for radiographic evaluation of clinical impressions.

IOPA X-ray revealed absence of permanent mandibular left central incisor and presence of a single conical tooth, mesiodens, with complete root formation. There is widening of periodontal ligament space of 32 and 41 (Fig. 5).



Figure 4: Intra oral view (Case 2)

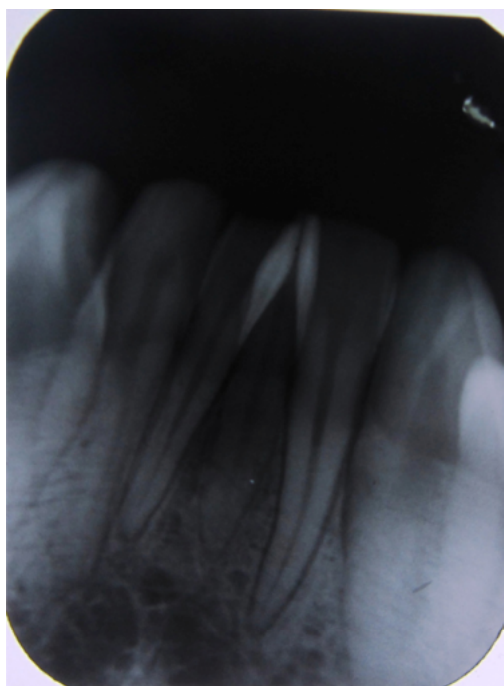


Figure 5: Intraoral radiograph of mandibular anterior segment (Case 2)

DISCUSSION

Developmental disturbance in tooth often occurs in human dentition and is characterized by alterations in number, size, and shape. Supernumerary teeth, a number and morphological developmental alternation, are classified according to morphology and region. Morphologically it could be either supplemental (duplicate the typical anatomy of posterior or anterior teeth) or rudimentary (conical or tuberculate).¹¹ It can be found in almost any region of the dental arch but occur most frequently in the maxilla, especially in the anterior segment and may occur singularly or in multiples and unilaterally or bilaterally. The prevalence of mesiodens varies between 0.09 and 2.05% in different studies. In permanent dentition, 0.15 to 3.8% incidence of mesiodens has been reported.¹² Erupted supernumerary teeth in the mandible are rare, is about 0.01% which indicates marked low value.¹³ Supernumerary teeth in the mandibular anterior region in both cases is fully erupted which is unusual.

It is essential not only to enumerate but also to identify supernumerary teeth present clinically and radiographically before a definitive diagnosis and treatment plan can be formulated.¹⁴ Supernumerary teeth can cause problems such as failed tooth eruption, permanent teeth displacement and crowding. Pathological complications may also exist as seen in case II. The extraction of erupted supernumeraries is treatment of choice, whereas in cases such as adjacent tooth

is clinically missing, where the supernumerary tooth will act as abutment or when the primary incisor is lost prematurely reshaping of mesiodens is done.¹⁵

Hypodontia means that one to six teeth are missing (excluding the third molars). In approximately 80% of reported cases of hypodontia only 1-2 teeth are missing, in 10% 4-more are missing while in fewer than 1%⁶ or more are absent.¹⁶ Incidence of hypodontia is 2.6-11.3 percent for permanent dentition¹⁶ and for mandibular central incisor is 2.2 percent, 0.7 percent for mandibular second molar and 47.3 percent for mandibular second premolar of the total 54.3 percent of congenitally missing teeth in the mandibular arch.¹⁷

Hypodontia presents significant challenges for the clinician as it alters the bone development of the jaws, resulting in spacing problems. The main objectives in the management of any hypodontia case are to improve esthetics and restore masticatory functions. The timing of extraction of retained primary teeth, as present in the first case, is also critical to the final results. Simple fixed bridges or minor orthodontic movement of teeth may take care of mild hypodontia. In more severe cases, a combined orthodontic–restorative–surgical approach may be required to rearrange space for future conventional fixed prostheses or implants.¹⁸⁻²⁰ Thus, it takes a collaborative team of multi-disciplinary professionals who deliver a comprehensive diagnosis, determine treatment needs and priorities, and monitor long-term planning and care for optimal results in the cases of CHH.²¹

Recent studies suggest that both genetic and environmental factors have been found to contribute to the etiology of tooth agenesis and supernumerary teeth. The future identification and analysis of genetic basis is very essential to treat these conditions better. So, the clinician should collaborate and refer a geneticist for further investigative research.¹⁰

REFERENCES

1. Brook AH. Multilevel complex interactions between genetic, epigenetic and environmental factors in the etiology of anomalies of dental development. *Arch Oral Biol* 2009; 54: S3-S17.
2. Orban B J. *Oral Histology and Embryology*. In: *Development and Growth of Teeth*. 13th ed. Mosby; 1997. p 46.
3. Brook AH. A unifying etiologic explanation for anomalies for tooth number and size. *Arch Oral Biol* 1984; 29: 373-8.
4. Vieira AR, Meira R, Modesto A, Murray JC. MSX1, PAX9, and TGFA contribute to tooth agenesis in humans. *J Dent Res* 2004; 83:723-7.
5. Ranta R. Numeric anomalies of teeth in concomitant hypodontia and hyperdontia. *J Craniofac Genet Dev Biol* 1988; 8: 245-51.
6. Varela M, Arrieta P, Ventureira C. Non syndromic concomitant hypodontia and supernumary teeth in an orthodontic population. *Eur J Orthod* 2009; 31: 632-7.
7. Sharma A. A rare non syndrome case of concomitant multiple supernumerary teeth and partial anodontia. *J Clin Pediatr Dent* 2001;25:167-9.

8. Sharma A. A rare case of concomitant hypo-hyperdontia in identical twins. *J Indian Soc Pedod Prev Dent* 2008; 26: 79-81.
9. Das G, Sarkar S, Bhattacharya B, Saha N. Coexistent partial anodontia and supernumary tooth in the mandibular arch: a rare case. *J Indian Soc Pedod Prev Dent* 2006; 24: 33-4.
10. Manjunatha BS, Nagarajappa D, Singh SK. Concomitant hypo-hyperdontia with dens invaginatus. *Indian J Dent Res* 2011; 22: 468-71.
11. Primosch RE. Anterior supernumerary teeth-assessment and surgical intervention in children. *J Pediatr Dent* 1981; 3:204.
12. Meighani G, Pakdaman A. Diagnosis and management of supernumerary (mesiodens): A review of the literature. *J Dent (Tehran)* 2010; 7:41-49.
13. Stafne EC. Supernumerary teeth. *Dental Cosmos* 1932; 74:653-659.
14. Scheiner MA, Sampson WJ. Supernumerary tooth. A review of literature and four case reports. *Aus Dent J* 1997; 42: 160-5.
15. Tatel FS. Reshaping a mesiodens. *Pediatr Dent* 2003; 25: 585-6.
16. Larmour CJ, Mossey P A, Thind BS, Stirrups DR. Hypodontia- A retrospective review of prevalence and etiology. Part I. *Quintessence Int* 2005; 36: 263 –70.
17. Shafer WG, Hine MK, Levy BM. A Text Book of Oral Pathology. In: Developmental disturbances of oral and paraoral structures. Ch 1.6th ed. Philadelphia: WB Saunders Company; 1993. pp46.
18. Thind BS, Stirrups DR, Forgie AH, Larmour CJ, Mossey PA. Management of hypodontia: orthodontic considerations. Part II. *Quintessence Int* 2005; 36: 345–53.
19. Forgie AH, Thind BS, Larmour CJ, Mossey PA, Stirrups DR. Management of hypodontia: restorative considerations. Part III. *Quintessence Int* 2005; 36: 437–45. 22.
20. Huang LH, Shotwell JL, Wang HL. Dental implants for orthodontic anchorage. *Am J Orthod Dentofacial Orthop* 2005; 127: 713–22.
21. WWW.yourdenstistryguide.com/genetic-abnormality_treatments.