Case Report

University J Dent Scie 2025; Vol. 11, Issue 2

A Rare Unusual Case of Non-Syndromic Mandibular Concomitant Hypo-Hyperdontia

Abstract:
The abnormalities in the size, number, shape or structure of the teeth are termed as dental anomalies. Tooth agenesis is the congenital absence of a tooth which leads to the developmental arrest of the corresponding tooth germ. Supernumerary teeth are the teeth that develop in addition to the regular number of teeth in the dentition, including odontoma. Concomitant hypo-hyperdontia (CHH) is an unusual condition. Its occurrence in the mandibular arch makes it very uncommon and rare. Herein, we present a case of extremely peculiar case of CHH in mandibular arch. There was missing 71, instead a conical shaped supernumerary tooth with no underlying permanent tooth bud was present. 81 was retained with no underlying permanent tooth bud. This was suggestive of agenesis of 31 and 41. Also, there was missing 75, which was indicative of agenesis of 75.

Key-words: Dental anomalies, Tooth agenesis, Supernumerary teeth, Concomitant hypo-hyperdontia

Introduction:

The abnormalities in the size, number,shape or structure of the teeth are termed as dental anomalies.[1] One of the most widely reported dental anomaly is the presence of supernumerary teeth.[2] Supernumerary teeth may be defined as teeth that develop in addition to the regular number of teeth in the dentition, including odontoma.[3] It affects both primary as well as early mixed dentition with male predilection.[2] In humans, the prevalence of non-syndromic supernumerary teeth for the permanent dentition varies between 1.2 to 6.0% andfor the primary dentition between 0.3 to 0.8%.[3] Supernumerary teeth can differ in appearance (dentesaccessoria) or they can be of normal shape (dentessupernumeraria). They can be present in or out of the dentition which hampers the normal occlusion and interferes the tooth eruption. They are commonly hypoplastic in nature.[4] However, there is no such serious complications caused by supernumerary teeth; root resorption, crowding, loss of vitality of adjacent teeth are encountered. Odontoma, ameloblastoma, fistula, formation of odontogenic cyst can also be seen.[5]

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Website: www.ujds.in

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DOI: https://doi.org/10.21276/ujds.2025.v11.i2.11

In 1873, Tomes defined numeric dental anomalies- Supernumerary tooth has an atypical anatomic form and are smaller than normal; Supplemental tooth mimics the adjacent teeth with same anatomy, form and function. Bush in 1897, analysed different morphologies of supernumerary teeth as- Conic has a conic form with small volume; Tuberculate has several cusps with short and hooked root.[4]

Tooth agenesis is the congenital absence of a tooth which leads to the developmental arrest of the corresponding tooth germ, with a prevalence ranging from 1.6% to 6.9%. In permanent dentition,lateral incisors and second premolars are the most common tooth involved. As their aetiology is still unclear; these two anomalies cannot be treated with clinical intervention.[1]

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Received : 15 April , 2025, **Published :** 30 June, 2025

How to cite this article: Akash Bhatnagar, & Aatya Takuli. (2025). A Rare Unusual Case of Non-Syndromic Mandibular Concomitant Hypo-Hyperdontia. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 11(2).

On very rare occasions, co-existence of both hypodontia and supernumerary teeth can be seen. This condition is termed as 'hypo-hyperdontia' or 'oligo pleiodontia'. More recently, the term 'concomitant hypo-hyperdontia (CHH)' has been used [6].According to the results of the study conducted by Chen et al., following conclusions can be made about individuals with CHH-Hyperdontia is less common than hypodontia; Most common supernumerary teeth are the maxillary mesiodens; Frequent missing tooth is second premolar; Hyperdontia is commonly seen in the anterior region; Hypodontia is more often in posterior region.[7]

Case Report:

A 10-year-old female reported to the Department of Pedodontics and Preventive Dentistry, with a chief complaint of conical tooth in lower left anterior front tooth region. The girl had sound mental and physical health.

Extraoral Assessment:

The patient had class I skeletal relationship. No TMJ and transverse plane asymmetry was observed. The lips were competent.

Intraoral Assessment:

The patient had mixed dentition with class I molar relationship on both sides; an overjet of 2 mm and increased overbite. No crowding was seen in either of the arches. Clinically, there was a conical shaped supernumerary tooth in mandibular anterior region and a retained primary tooth irt 81.[Fig.1] Tooth 71 was congenitally missing, and in its place, a conical-shaped supernumerary tooth was present, with no evidence of an underlying permanent tooth bud. Tooth 81 was retained, also with no underlying permanent successor, suggesting agenesis of teeth 31 and 41. Additionally, tooth 75 was absent, indicative of its agenesis.[Fig.2] The patient's oral hygiene was fair with small amounts of plaque being present in the cervical margins of the posterior dentition.

Radiographic Assessment:

Radio Visio Graphy (RVG) of mandibular anterior tooth region was taken. RVG in respect to left anterior tooth region showed missing 71, instead a conical shaped supernumerary tooth with no underlying permanent tooth bud was present. RVG in respect to 81 showed retained 81 with no underlying permanent tooth bud. This was suggestive of congenitally missing 31 and 41. Moreover, the root of 42 caused slight root resorption which was visible irt 81. [Fig. 3]

Treatment:

Pulpectomy was done irt 81 with Gutta Percha obturation. This was done to slow down the resorption rate of the root of 81, as 41 was congenitally missing. This would aid to maintain the space for future implant placement. [Fig. 4]

Outcome and Follow Up:

The patient is to be recalled on every three months to see the resorption rate in the root of 81. The visits will help in intervening in the future at an appropriate time. At the one-year follow-up, all primary molars and canines had exfoliated. The permanent premolars on the right side were fully erupted, while those on the left side exhibited delayed eruption, likely due to the agenesis of tooth 75.[Fig 5 and 6]

Discussion:

Details of the published cases in last 20 years with mandibular hypo-hyperdontia

Author, year	Age/Gender	Arch	Hyperdontia	Hypodontia
Das et al., 2006[8]	8/Female	Mandible	Mesiodens	31, 41
Nayak et al., 2010[9]	28/Male	Mandible	Mesiodens	32, 42
Venkataraghavan et al., 2011[10]	9/Female	Mandible	Mesiodens	31, 41
Verma et al., 2012[11]	15½/Male	Mandible	Mesiodens	31, 41
Nirmala et al., 2013[12]	8.5/Female 10.9/Male 9.2/Male	Mandible Mandible Mandible	Mesiodens Mesiodens Mesiodens	41 41 41
Muttineni et al., 2022[13]	25/Female	Mandible	Mesiodens	31, 41
Present case, 2024	10/Female	Mandible	71 region	71, 75, 31, 41

This table represents cases published in last 20 years with agenesis of permanent mandibular central incisors along with presence of supernumerary tooth in mandibular region.

Cases reported by Das et al., Venkataraghavan et al., Verma et al. and Muttineni et al., in 2006, 2011, 2012 and 2022 respectively had hypodontia of 31 and 41.[8,10,11,13] Nayak et al. reported a case of hypodontia of 32 and 42 in the year 2010.[9] In 2013, Nirmala et al. reported a case series of hypodontia of 41.[12] The above stated cases had mesiodens. Hypodontia of 71, 75, 31 and 41 along with hyperdontia in 71 tooth region makes this case exceptionally unique and unusually rare. To the best of our knowledge, no case has been published similar to this case.

Probable cause for the agenesis in non-syndromic hypodontia is mutations in AXIN2 and PAX9genes. It is usually autosomal dominant. However autosomal recessive and X-linked modes have also been reported.[14,15] A number of genes control the process of odontogenesis. The gene products (proteins) also play a role in the formation of tooth. These gene products either function as extracellular messengers or may affect the chromosomes. MSX-1 and MSX-2 are two of the DNA control genes.[10]

Figure 1- pre-operative view showing retained 81 and conical shaped supernumerary tooth

Figure 2- pre-operative view showing missing 31,41,75

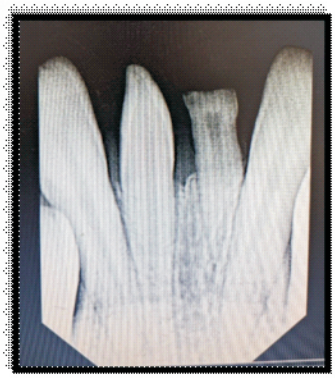

Figure 3- pre-operative RVG showing retained 81, Conical shaped supernumerary tooth and missing 31 and 41

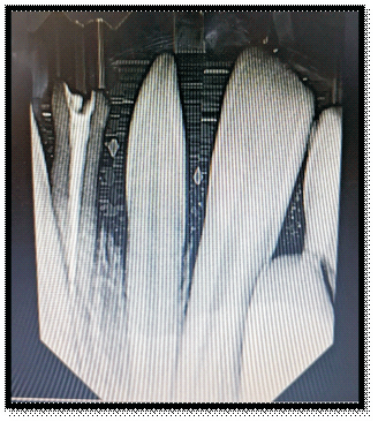

Figure 4- Post Operative view showing Gutta Percha obturationirt 81

Figure 5- Follow-up at one year (Intra oral view)

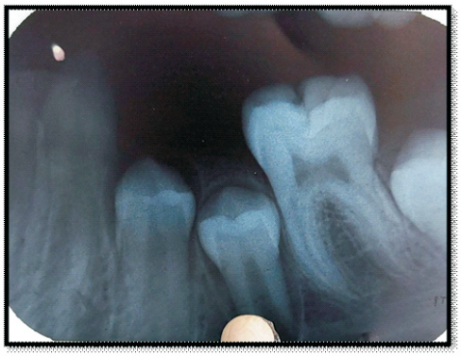

Figure 6- Follow-up at one year (Left side intra oral periapical radiograph)

Conclusion:

In development of the dentitions, hypodontia and hyperdontia are the two opposite extremes. These two conditions can be encountered frequently in the patients. Occurrence of both of the numeric dental anomalies (hypo-hyperdontia) in the same individual is a very rare condition. Especially, its occurrence in the mandibular anterior region is extremely noticeable. Treatment of the supernumerary teeth depends on the type and location of supernumerary teeth and their effect on the adjacent teeth. CHH is an unusual condition. Its occurrence in the mandibular arch makes it extremely peculiar and rare. The present case is a unique case of mandibular CHH. Our case exhibited agenesis of 31, 41 and 75. There was a retained 81 and a supernumerary tooth instead of 71, in 71 tooth region without association of any syndrome or systemic condition. A thorough clinical examination and radiographic evaluation helped in making the proper diagnosis of CHH in mandibular region.

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