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FACIAL AND PALATAL TALON CUSP ON A MESIODENS ASSOCIATED WITH HYPERDONTIA- A RARE OCCURRENCE

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ABSTRACT: Supernumerary teeth or hyperdontia are those that are additional to the normal complement of teeth. Mesiodens is an extra tooth most commonly seen in the premaxillary region, while talon cusp is a well demarcated additional cusp extending form cingulum or cemento- enamel junction to the incisal edge. It is usually present on labial or palatal surface of primary and permanent anterior teeth. Occurrence of talon cusp on a mesiodens is an uncommon phenomenon. This paper presents a rare case of facial and palatal talon cusp on a mesiodens in association with hyperdontia, reported in a 12-year old girl.

hyperdontia.

Case Report

front teeth region.

KEYWORDS: Hyperdontia, mesiodens, talon cusp, syndrome.

INTRODUCTION

Supernumerary teeth or hyperdontia is an odontostomatologic anomaly characterized by an excess in the tooth number, both erupted and non- erupted¹. The most common supernumerary tooth is mesiodens which refers to a tooth/teeth present in the premaxilla between two central incisors that accounts for 80% of all supernumerary teeth². The prevalence of hyperdontia in various populations is reportedly between 0.15% and $3.8\%^3$. The prevalence of mesiodens varies between 0.09% and 2.05% in different studies and is reported to be more common in males than in females⁴.

The etiology of hyperdontia is not clear, though a number of theories have been postulated which include phylogenetic theory, hyperactivity of dental lamina, the dichotomy theory and the role of genetic and environmental factors as possible causes^{5,6}.

Talon cusp also known as Eagle's talon is an accessory cusp like structure or an extra cusp on an anterior tooth arising as a result of evagination on the surface of the crown before calcification has occurred⁷. The prevalence rate of talon cusp varies from 0.04% to 10% in English literature. The permanent dentition is affected more frequently than primary dentition and there is a slight male predilection⁸.

Occurrence of talon cusp on a mesiodens is in itself a rare phenomenon and its co-occurrence on facial and

A 12 year old girl was reported to the Out Patient Department of Pedodontics and Preventive Dentistry, S.C.B. Dental College and Hospital, Cuttack, Odisha,

palatal aspect is rarest. This paper reports a case of facial

and palatal talon cusp on mesiodens in association with

The patient appeared healthy and of normal physical development for her age. Her medical and family history was non-contributory. There was no reported history of orofacial trauma. No abnormalities were found on extra oral examination.

India, complaining of a large, unsightly tooth on the upper

On intra oral examination, completely erupted supernumerary tooth with an abnormal morphology between two central incisors was noticed. Patient exhibited a full complement of permanent dentition (excluding 3rd Molar) with no other dental abnormalities.

The supernumerary tooth resembled maxillary central incisor on labial aspect. It had three well developed lobes. On further examination, an accessory cusp on both facial and palatal surface of the mesiodens was seen. On labial

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Fig.1. Intra oral view showing Type I facial talon cusp on mesiodens.



Fig.2. Intra oral view showing Type-I palatal talon cusp on mesiodens (arrow).



Fig.3. Maxillary Occlusal radiograph showing double 'V' shaped radio-opaque structure superimposed on the crown of mesiodens along with two impacted supernumerary teeth.

aspect a markedly prominent cusp that extends from the cervical region towards the incisal edge, giving an inverted T-shape was found (Fig. 1). The palatal aspect showed a well defined horn like accessory cusp with deep developmental groove without caries (Fig. 2). As the tooth occupied the midline, there was no place for other teeth, as a result permanent right central incisor was displaced labially and right lateral incisor was displaced palatally. Oral hygiene of the patient was poor with chronic generalized gingivitis.

Both Occlusal (Fig. 3) and Intra-oral Periapical (IOPA) (Fig.4) radiograph showed mesiodens with well developed root and a single root canal and a double "V" shaped radio opaque shadow superimposed over the crown of mesiodens, with the tip of the "V" towards the incisal edge.



Fig.4. I.O.P.A. radiograph showing mesiodens with well-developed root with single canal.

Radiograph also revealed presence of two more impacted supernumerary teeth high up on the palate. Orthopantomogram (OPG) confirmed the presence of three supernumerary teeth.

Based on clinical and radiographic findings, one erupted supernumerary tooth was diagnosed as mesiodens with facial and palatal talon cusp. Out of the two impacted supernumerary teeth, one was conical, the other was odontome. After a detailed evaluation, extraction of all three supernumerary teeth followed by orthodontic treatment was planned. Extraction was done under local anesthesia after oral prophylaxis [Fig. 5, 6(a), 6(b)]. The patient did not return for orthodontic treatment and was lost to recall.

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Fig.5. Extracted supernumerary teeth and mesiodens.



Discussion

Supernumerary teeth may occur singly, in multiple, unilaterally and bilaterally in maxilla, mandible or both. They may erupt normally, stay impacted, appear inverted or take a horizontal position.

Multiple supernumerary teeth are usually associated with conditions such as cleft lip and palate or syndrome like Down's syndrome, Cleidocranial dysplasia and Gardner's syndrome⁹. The occurrence of supernumerary teeth in Indian population is 87% with single supernumerary, 12% with two and 1% with multiple supernumerary teeth¹⁰. Very rarely three or more supernumerary teeth are seen in the same individual in



Fig.6 (b). Extracted mesiodens showing Labial talon cusp(arrow

the absence of any associated systemic condition or syndrome¹¹ as in our case.

Supernumerary teeth may vary in form and size from a simple odontome, through a conical or tuberculate tooth, to a supplemental tooth which closely resembles a normal tooth¹². Koch et al have classified mesiodens as 56% conical, 12% tuberculate, 11% supplemental and 12% with other configuration¹³. In the present case, a multilobed mesiodens was seen. So it can be considered under "other configuration" category of mesiodens.

Talon cusp was first described by W.H. Mitchell in 1892 and later named as 'Talon cusp' by Mellor and Ripa in 1970. Talon cusps are morphologically well-delineated accessory talon shaped cusp projecting form the lingual or

Table -1: Hattab et al classification of the talon cusp on the basis of degree of cusp formation and extension¹⁸

Type -1	Talon: Additional cusp extends to atleast half the distance from the cementoenamel junction and the incisal edge.
Type -2	Semi-talon: Is an additional cusp extending to less than half the distance from the cementoenamel junction and the incisal edge.
Type -3	Trace talons: Present as enlarged or prominent cingulum.

Table -2 : Reported Cases of talon cusp in mesiodens tooth

SI. No.	Author and Year	Mesiodens type and shape	Location of talon cusp	Talon cusp type
1	Hattab et al (1996)	Permanent, conical	Palatal	Type-1
2	Salama et al (1990)	 Primary, conical Permanent, conical 	Palatal Palatal	Туре-3 Туре-3
3	Zhu et al (1997)	Permanent, conical	Palatal	Туре-3
4	Nadkarni et al (2002)	Permanent, conical	Palatal	Туре-3
5	Topaloglu et al (2008)	Primary, conical	Facial and Palatal	Type-1
6	Siraci et al (2006)	Primary, conical	Facial and Palatal	Type-2
7	Nagaveni et al (2010)	Permanent, Multilobed	Palatal	Type -1
8	Babaji et al (2010)	Permanent, conical	Palatal	Type-1
9	Nagaveni et al (2010)	Permanent, conical	Facial	Type-1
10	Rani et al (2010)	Permanent, conical, fused with lateral	Palatal	Type-1
11	Nuvvula et al (2011)	Permanent, Supplemental	Palatal	Type-3
12	Verma et al (2009)	Permanent, Supplemental	Palatal	-
13	Neeraja et al (2012)	Permanent, Supplemental	Facial	-
14	Hegde et al (2013)	Permanent, Supplemental	Palatal	Type-1
15	Busnur et al (2013)	Permanent Multilobed	Palatal	Type-1
16	Sulabha et al (2014)	Permanent	Facial	Type-1
17	Nagaveni et al (2014)	1. Permanent conical	Facial	Type -3
		2. Permanent conical	Facial	Type -1
		Permanent conical	Facial	Type -1
		 Primary conical 	Facial	Type -1
18	Mukhopadhyay et al (2015)	Permanent Supplemental	Palatal	Type-1
19	Jain et al (2015)	Permanent conical	Facial	Type-1
20	Acharya S. (2015)	Permanent	Facial	Type -1

facial surface of the crown of incisors and extending at least half of the distance from the cemento enamel junction (CEJ) to the incisal edge¹⁴. Histologically it is composed of normal enamel, dentin with or without extension of pulpal tissue.¹⁵

The exact pathogenesis of this anomaly is unknown. It is thought to occur during morphodifferentiation stage because of outward folding of inner enamel epithelial cells and transient focal hyperplasia of mesenchymal dental papilla or a combination of genetic and environmental factors (multifactorial).^{14, 16}

The development of both supernumerary teeth and talon cusp may be attributed to the hyper production of dental component from the dental lamina which is more common in maxillary anterior region¹⁷.

Hattab et al classified the talon cusp on the basis of degree of cusp formation and extension¹⁸ (**Table 1**). Based on this classification, our reported case was categorized as type I talon on both surfaces.

In the permanent dentition, maxillary lateral incisor is most commonly affected (67%) followed by central incisor (24%) and canines (9%).¹⁹ Occurrence of talon cusp in mesiodens is extremely rare with countable case reports available in Literature **(Table 2).**

In the majority of times, talon cusp is seen on palatal or facial surface of anterior teeth. Extensive literature search revealed only two publications of both facial and palatal talon in supernumerary teeth. One publication is by Siraci et al(2006) who reported both facial and palatal talon on supernumerary primary incisors with pulpal extension detected by a micro-CT²⁰. Another case is reported by Topaloglu et al (2008) who also found both

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Talon cusp can be found as an isolated anomaly or with other dental anomalies like dens invaginatus, impacted mesiodens, peg lateral incisors, unerupted canines, bifid cingulum, shovel shaped incisor and complex odontome²². It appears to be more prevalent in Rubinstein-Taybi syndrome, Mohr syndrome, Sturge-Weber syndrome and incontinentia pigmenti²³. Such association was not seen in this case.

Both mesiodens and talon cusp are considered most common dental anomalies affecting permanent dentition. Mesiodens can cause a wide range of complications like failure of eruption, displacement of adjacent tooth, esthetic impairment, root resorption of adjacent tooth, midline diastema and cyst formation^{9,10,11}. Small talon cusps are usually asymptomatic and need no treatment. Various known complications associated with large prominent talon cusp are occlusal interference, displacement of adjacent teeth, carious lesion in the developmental groove, pulpal exposure due to cuspal attrition, periapical pathosis, irritation to tongue and lip, periodontal problem and possibility of TMJ pain^{8,14,15}.

The management of talon cusp differs from case to case according to the clinical presentation of each case and should be as conservative as possible. In the present case as the talon cusp occurred in mesiodens and mesiodens caused many problems like poor esthetics, displacement of adjacent teeth with resultant crowding, extraction of mesiodens was done. Munns suggested that the earlier the offending supernumerary tooth is removed, the better the prognosis³⁵.

CONCLUSION

Simultaneous occurrence of two anomalies in an entity is rare. Mesiodens with facial and palatal talon cusp with multiple supernumerary teeth is such an entity. Early diagnosis and timely intervention should be done to minimize the potential complications.

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