SYNODONTIA WITH TALON CUSP: A CASE REPORT AND REVIEW OF LITERATURE

Akhil A Shankar[1] Ajit V. Koshy[2] Deepinder Singh Duggal[3] Rishikesh C Dandekar[4]

[1]*Sr. Lecturer,Dept. of Oral Pathology,Y. M. T. Dental College and Hospital, ,Navi.Maharashtra, India.*
[2]*Asst. Professor,Dept. of Oral Pathology.E-mail: ajit_judy_jason@yahoo.co.in*
[3]*Reader, Dept. of Oral Pathology,M. A. Rangoonwala Dental College, Pune – 411001.*
[4]*Professor & Head,Dept. of Oral Pathology,M. A. Rangoonwala Dental College, Pune – 411001.*

Corresponding Author: Akhil A Shankar Dept. of Oral Pathology,Y. M. T. Dental College and Hospital,Institutional Area, Sector – 4,Kharghar,Navi Mumbai – 410210.Maharashtra, India. Ph: +91-8108019148. E-mail: akhil1904@hotmail.com

Abstract

Synodontia or Fusion is more commonly seen in the anterior and maxillary region. Fusion of a supernumerary tooth to one in the normal series is not an uncommon finding, but these anomalies in conjunction with a talon cusp form a rare case. The etiology, prevalence and clinical features of the aforementioned anomalies have been reviewed in detail.

Introduction

Development of the tooth is a continuous process in which a number of physiologic growth processes and various morphologic stages interplay to achieve the tooth's final form and structure. Interference with the stage of initiation, a momentary event, may result in a supernumerary tooth or in single or multiple missing teeth (hypodontia and oligodontia respectively)[1, 2]. A supernumerary tooth is one that is additional to the normal series and can be found in almost any region of the dental arch[2, 3]. They are not a very uncommon finding and often occur in the maxillary anterior region[4,5].

It has been stated that development of supernumerary teeth may cause various pathologies. Approximately 75% of supernumerary teeth are impacted and asymptomatic, and most of these teeth are diagnosed coincidentally during radiographic examination.[6]

Synodontia or Fusion is an "organic" union of two or more individual teeth, the criterion being union of the dentin; the condition of the pulp and enamel being immaterial[7]. This condition is more commonly seen in the anterior and maxillary regions. In addition to affecting the normal teeth, there might be cases of fusion between a normal tooth and a supernumerary tooth[5]. Fusion may be unilateral or bilateral and commonly occurs in permanent teeth, with predominance for the anterior region[8].

Talon Cusp is an uncommon odontogenic anomaly comprising of an accessory cusp-like structure, more commonly seen on the palatal surfaces of the maxillary incisors. This unusual dental anomaly showing an accessory cusp-like structure projecting from the cingulum to the cutting edge was first described by Mitchell in 1892. It was thereafter named Talon cusp by Mellor and Ripa[9] due to its resemblance to an eagle's talon. It has been defined as a supernumerary, accessory talon-shaped cusp projecting from the lingual or facial surface of the crown of a tooth and extending for at least half the distance from the cemento-enamel junction to the incisal edge[10].

Case Report

A 19 year old female patient was seen in the out-patient department with a chief complaint of an oversized tooth in the maxillary left anterior region. The patient's main concern was aesthetics and wanted treatment for the same. Intra-oral examination revealed the presence of the complete complement of the dentition, normal for that particular age (excluding the third molars). However, tooth number 21 was overtly large and showed the presence of a deep groove on the labial surface extending from the incisal edge to the cervical margin resulting in the formation of a notch on the incisal edge (Figure 1). Lingual examination of the tooth revealed an accessory cusp-like structure, resembling a talon cusp extending from the cervical margin of the supernumerary tooth towards its incisal edge (Figure 2, Figure 3).

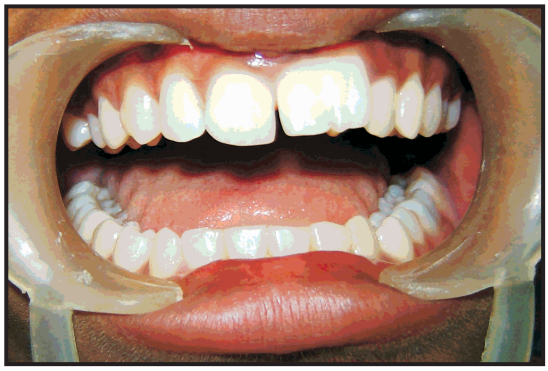

Fig 1: Fusion of 21 with supernumerary tooth

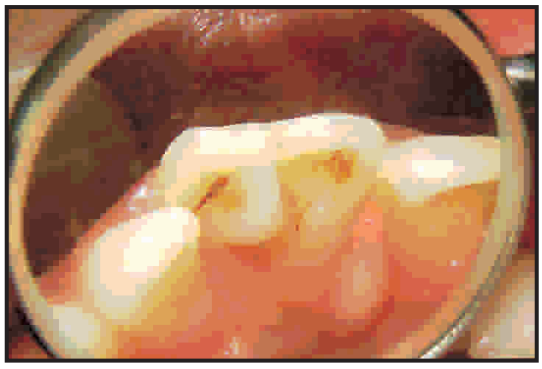

Fig 2: Palatal Aspect – Presence of Talon Cusp on supernumerary tooth

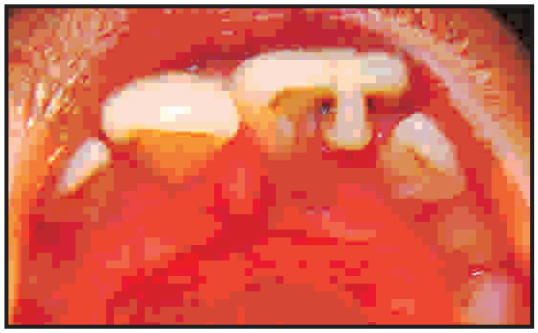

Fig 3: Line of Fusion with Talon Cusp

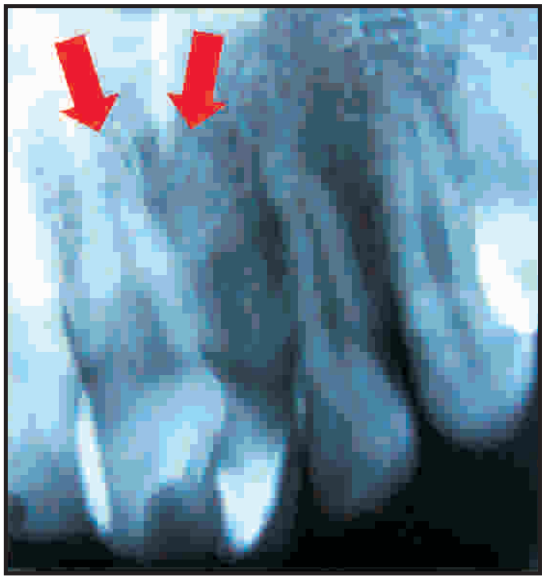

Fig 4: Presence of two separate root canals seen on an IOPA

The patient's history was not contributory and did not reveal any genetic phenomena. General examination of the patient did not suggest any associated abnormalities. Radiographic examination of these teeth revealed presence of two separate roots with individual root canals (Figure 4). These findings were suggestive of fusion of 21 with a supernumerary tooth, and the presence of a talon cusp on the supernumerary tooth.

Discussion

Most authors are of the opinion that the maxillary anterior supernumerary teeth occur more frequently in males than females.[11-15] However, few studies concluded that there is no specific sex predilection, and have found the incidence of supernumerary teeth to be

3.14%.[16] Supernumerary teeth occur frequently in the permanent dentition, more so in the anterior region as mesiodens than any other part of either dental arch.[13, 17] Other authors suggest that the prevalence of supernumerary teeth in primary and permanent dentition was calculated to be 5.9% and 1.1% respectively, although the occurrence of mesiodens was separately calculated to show a prevalence of 8.7%.[13]

The aetiology of the supernumerary teeth however remains unclear. Several theories, such as the 'phylogenetic theory' (Smith, 1969)[18], the 'dichotomy theory' (Liu, 1995)[19], a hyperactive dental lamina (Primosh, 1981; Brook, 1984)[20, 21] and a combination of genetic and environmental factors-unified etiologic explanation (Brook, 1984)[21], have been suggested.

The 'phylogenetic theory'[18] relates to the phylogenetic process of atavism, which is the return to or the reappearance of an ancestral condition or type. It was suggested that hyperdontia is the result of a reversional phenomenon or atavism. Phylogenetic evolution has resulted in a reduction in both the number and the size of man's teeth. This theory has been rejected by many authors. The 'dichotomy theory' is where a supernumerary tooth is created as a result of complete splitting of the tooth bud[19]. The tooth bud splits into two equal or different-sized parts resulting in two teeth of equal size or one normal and one dysmorphic tooth, respectively.[2]

The hyperactive dental lamina theory suggests that supernumerary teeth are formed as a result of local, independent, conditioned hyperactivity of the dental lamina. According to this theory, the lingual extension of an additional tooth bud leads to a eumorphic tooth, while the rudimentary form arises from proliferation of epithelial remnants of the dental lamina induced by pressure of the complete dentition.[20] Remnants of the dental lamina can persist as epithelial pearls or islands, "rests of Serres" within the jaw. If the epithelial remnants are subjected to initiation by induction factors, an extra tooth bud is formed resulting in the development of either a supernumerary tooth or odontome. Many causes, both genetic and environmental, have been proposed for supernumerary teeth, hypodontia, macrodontia and microdontia. Brook (1984)[21] stated that supernumerary teeth are more common in the relatives of affected children than the general population with males often having supernumerary tooth and macrodontia and females more frequently having hypodontia and microdontia.

The presence of hyperdontia may be associated with various developmental disorders. The two most common disorders with a significant incidence of supernumerary teeth are cleft lip and cleft palate[22], and cleidocranial dysplasia[23]. Less frequently associated developmental disorders include Gardner's Syndrome, Fabry-Anderson's Syndrome, chondroectodermal dysplasia (Ellis-van Greveld Syndrome), incontinentia pigmenti, and tricho-rhino-phalangeal syndrome.[7]

Fusion can occur between teeth of the same dentition or mixed dentitions, and between normal and supernumerary teeth[24]. In cases of fusion between a normal and supernumerary tooth, the number of teeth in the dental arch complement the normal dentition and differentiation from gemination is clinically difficult or impossible. A diagnostic consideration, but not a set rule, is that supernumerary teeth are often slightly aberrant and present a cone-shaped clinical appearance. Thus, fusion between a supernumerary and a normal tooth will generally show differences in the two halves of the joined crown. However, in cases of gemination the two halves of the joined crown are commonly mirror images.[25]

The aetiology of fusion is still unknown, but the influence of pressure or physical forces producing close contact between two developing teeth has been reported as one possible cause.[4] Genetic predisposition and racial differences have also been reported as contributing factors.[25]

Fusion of teeth is reported to be 0.3 per cent. It is also reported that fusion of central and lateral incisors occur more than of lateral incisor and canine.[26] Related to Mader's "two-tooth rule",[27] the anomaly may represent a fusion between a normal tooth and a supernumerary tooth. Because no missing permanent tooth was seen in this patient, it can be presumed that a fusion with a supernumerary tooth occurred.

Talon cusp is an unusual and relatively rare anomaly which most frequently affects the maxillary permanent incisor. The term, Talon Cusp refers to the same condition as Dens Evaginatus, but on the anterior teeth. The pathogenesis of this lesion is thought to be the proliferation and evagination of an area of the inner enamel epithelium and subjacent odontogenic mesenchyme into the dental organ during early tooth development.[28] Hence, it is considered to be an antithesis of the mechanism of development of the dens in dente or dens invaginatus. They maybe seen in patients with Rubenstein-Taybi, Sturge-Weber or Mohr syndrome.[4]

Small talon cusps are usually asymptomatic and need no treatment. Large talon cusps may cause clinical problems including occlusal interference, displacement of the affected tooth, irritation of the tongue during speech and mastication, carious lesion in the developmental grooves that delineate the cusp, pulpal necrosis, periapical pathosis, attrition of the opposing tooth and periodontal problems due to excessive occlusal forces.[4] However, none of these problems were noted in our case.

Chawla et al[29] found a prevalence of 7.7% in children from North India. Due to a variation in the presence of Talon Cusp clinically, and in order to have a diagnostic criteria, it has been classified into three types by Hattab et al[28]:

Type 1: Talon – refers to a morphologically well-delineated additional cusp that prominently projects from the palatal (or facial) surface of a primary or permanent anterior tooth and extends at least half the distance from the cemento-enamel junction to the incisal edge.

Type 2: Semi Talon – refers to an additional cusp of a millimeter or more extending less than half the distance from the cemento-enamel junction to the incisal edge. It may blend with the palatal surface or stand away from the rest of the crown.

Type 3: Trace Talon – an enlarged or prominent cingula and their variations, i.e. conical, bifid or tubercle-like.

Using this classification, we grade our case as a Type 1 Talon Cusp.

To the best of our knowledge, a case of Fusion with Talon Cusp has been published in the English literature at two occasions, hence, making this the third published case. The final diagnosis given was Fusion of the Left Maxillary Central Incisor with a Supernumerary Tooth and a Type 1 Talon Cusp.

Reference

1. *Hattab FN, Yassin OM, Rawashdeh MA. Supernumerary teeth: report of three cases and review of the literature. ASDC J Dent Child 1994;61(5-6):382-93.*
2. *Fazliah SN Supernumerary Tooth: report of a case. Archives of Orofacial Sciences 2007; 2:54-58.*
3. *McNamara CM, Garvey MT, Winter GB. Root abnormalities, talon cusps, dentes invaginati with reduced alveolar bone levels: case report. Int J Paediatr Dent. 1998; 8:41–45.*
4. *Shafer WG, Hine MK, Levy BM. Developmental Disturbances of Oral and Paraoral Structures. In Sivapathsundaram B, Rajendran R (ed) A Textbook of Oral Pathology. 5th ed. pp 3-112. New Delhi: Elsevier, 2008.*
5. *Neville BW, Damm DD, Allen CM, Bouquot JE. Developmental Defects of the Oral and Maxillofacial Region. In Oral & Maxillofacial Pathology. 2nd ed. pp 1-24. New Delhi: Saunders, 2004.*

6. *Gunduz K, Muglali M. Non-syndrome multiple supernumerary teeth: a case report. Journal of Contemporary Dental Practice 2007; 8:1-5.*
7. *Thoma KH. Developmental Disturbances. In Gorlin R J, Goldman H M (ed) Oral Pathology. 6th ed. pp 124-126. St. Louis-Toronto-Princeton Barcelona: Salvat Ed. C.V. Mosby 1973.*
8. *McDonald RE, Avery DR, Dean JA. In Dentistry for the Child and Adolescent. 8th ed. pp 665-666. New Delhi: Mosby, 2004.*
9. *Mellor JK, Ripa LW. Talon cusp: a clinically significant anomaly. Oral Surgery, Oral Medicine, and Oral Pathology (1970) 29:225–228*
10. *Oredugba FA. Mandibular Facial Talon Cusp: case report. BMC Oral Health 2005, 5:9*
11. *Castaldi CR, Bodnarchuk BA, MacRae PD, Zacherl WA. Incidence of congenital anomalies in permanent teeth of a group of Canadian children aged 6-9. J Can Dent Assoc 1966; 32: 154-159*
12. *Luten JR. The prevalence of supernumerary teeth inprimary and mixed dentitions. J Dent Child 1967; 34: 346-353*
13. *Tay F, Pang A, Yuen S. Unerupted maxillarysupernumerary teeth: report of 204 cases. J Dent Child 1984; 51: 289-294*
14. *Hurlen B, Humerfelt D. Characteristics of premaxillary hyperodontia, a radiographic study.Acta Odontol Scand 1985; 43: 75-81*
15. *Zilberman Y, Malron M, Shteyer A. Assessment of 100 children in Jerusalem with supernumerary teeth in the premaxillary region. J Dent Child 1992; 59: 44-47*
16. *Hayes C. Anodnotia of the third molar and other dental anomalies in Jamaica. A retrospective study. West Indian Dent J 1996; 3: 54–9*
17. *Ravn JJ. Aplasia, supernumerary teeth and fused teeth in the primary dentition: An epidemiologic study. Scand J Dent Res 1971; 79: 1-6*
18. *Smith JD (1969). Hyperdontia: report of a case. J Am Dent Assoc, 79: 1191-1192.*
19. *Liu JF (1995). Characteristics of premaxillary supernumerary teeth: A survey of 112 cases. ASDC J Dent for Child, 62: 262-265.*
20. *Primosch RE (1981). Anterior supernumerary teeth – assessment and surgical intervention in children. Paed Dent, 3: 204-215.*
21. *Brook AH (1984). A unifying etiological explanation for anomalies of human tooth number and size. Archs Oral Biol, 29: 373-378.*
22. *Böhn A. Dental anomalies in harelip and cleft palate. Acta Odontol Scand 1963; 21: 1-114*
23. *Richardson A, Deussen F F. Facial and dental anomalies in cleidocranial dysplasia: a study of 17 cases. Int J Paediatr Dent 1994; 4: 225-231*
24. *Turell IL, Zmener O. Endodontic therapy in a fused mandibular molar. J Endod 1999;25:208-209*
25. *Nunes E, Moraes IG de, Novaes M de O, Sousa SMG de. Bilateral fusion of mandibular second molars with supernumerary teeth: case report. J Braz Dent 13:*
26. *Buenviaje TM, Rapp R. Dental anomalies in children: A clinical and radiographic survey. J Dent Child 1984;51:42-46*
27. *Mader CL. Fusion of teeth. J Am Dent Assoc. 1979; 98:62–64*
28. *Hattab FN, Yassin OM, al-Nimri KS. Talon cusp in permanent dentition associated with other dental anomalies: review of literature and report of seven cases. ASDC J Dent Child 1996; 63(5):368-76*
    Chawla HS, Tewari A, Gopalakrishnan NS. Talon cusp — a prevalence study. J Indian Soc Pedod Prev Dent 1983; 1(1):28-34

Source of Support - Nil

Conflict of Interest - None declared