

DOUBLE HEADED MANDIBULAR PREMOLAR – A MIRACULOUS DEVELOPMENTAL ANOMALY.

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Abstract

Deviation from normal is called an anomaly. Fusion is the developmental anomaly in the shape of the tooth, which is defined as the union of two normally separated tooth buds with the resultant formation of a joined tooth. We report a miraculous anomaly tooth specimen of a mandibular premolar with two crowns, one on the head and the other on the tail end of the tooth. The clinical features, radiographic findings and the various etio-pathogenetic possibilities of this unique tooth anomaly are discussed.

Key words: Double headed tooth, Fusion, and Anomaly.

Introduction

Fusion is a developmental anomaly in tooth morphology characterized by union of two adjacent teeth, which may be due to union of two separate tooth buds². Depending on the stage of development, union may be complete or incomplete, and the tooth may have separate or fused root canals. The condition is more common in deciduous than in the permanent dentition¹. Double teeth occur in most dentitions with higher frequency in anterior maxillary regions. Fusion is common in mandible and gemination in maxilla but fusion between supernumerary and normal tooth are found to be more common in maxilla³. Fusion is a rare occurrence in the mandibular posterior teeth, and only few cases of fusion involving molar and premolar teeth have been reported^{1,2}.

Other synonyms of fusion are 'Connate' (by Tomes in 1859), 'Double teeth' (by Miles in 1954). De Jonge in 1955 proposed the terms 'Schizodontia' to describe the teeth which originate by partial division of dental analage and 'Synodontia' for those formed by the inability of adjacent tooth to retain their individuality³.

Fusion can occur between teeth of the same dentition or mixed dentitions². It can also occur between normal tooth and a supernumerary tooth such as mesiodens or paramolar¹. Supernumerary teeth are often slightly aberrant and present a cone shaped clinical appearance. Thus, the fusion with a supernumerary to normal tooth will generally show differences in the two halves of the joined crown. Fused teeth are usually asymptomatic². The overall prevalence appears to be approximately 0.5% in deciduous teeth and 0.15% in permanent dentition and 0.02% bilateral in both dentitions. Fused teeth may show unusual configurations of their pulp chambers, root canals, or crowns¹.

A supernumerary tooth is one that is additional to the normal series and can be found in almost any region of the dental arch (Garvey *et al*)⁶. These are developmental disturbances occur during odontogenesis. They occur both in deciduous and permanent dentition⁹. In the primary dentition, the incidence is said to be 0.3%-0.8% and in the permanent dentition 1.5%-3.5% (Mason *et al.*, 2000). There is no significant sex distribution

in primary supernumerary teeth; however, males have been shown to be affected more in permanent dentition than in females. Supernumerary teeth can be classified according to their location in dental arch: mesiodens, paramolar, and distomolar or according to their morphological forms: conical, tuberculate, supplemental and odontome (Mitchel, 1989). Primosh (1981) classified supernumerary tooth into two types according to their shape as supplemental (eumorphic) and rudimentary (dysmorphic). The supernumerary teeth position can be recorded as 'between central incisors' and 'overlap' and its orientation can be described as 'vertical', 'inverted' and 'transverse' (Gregg and Kinirons, 1991) ⁶. They may be single, multiple, unilateral or bilateral, erupted or unerupted and in one or both jaws ⁹.

The most common location of supernumerary teeth is at the premaxillary region (Hattabb *et al.*, 1994; Koch *et al.*, 1986) ⁶. The incidence of occurrence of mesiodens is 0-1.9% for deciduous teeth and between 0.15-3.8 percent for permanent teeth with male to female occurrence ratio of 2:1 ⁹. The frequency of inverted mesiodens constitutes to approximately 9-67% of all reported cases. To date a total of 278 single inverted mesiodens have been reported ^{11,12}.

In general, the incidence of supernumerary teeth ranges from 0.1-1% in the population and most commonly affected location is the upper central incisor area. They may be in vertical, horizontal or inverted position ⁷.

Case report

The tooth anomaly specimen was obtained from a dental clinic at Trivandrum, India with minimal clinical history. The mandibular left first premolar tooth was extracted at the clinic from a 36 year old male patient with the complaint of mobility and pain. The clinician could not give an assurance about the presence or absence of the

mandibular second premolar on the same side. Knowing the significance of such a unique tooth specimen, we made an attempt to trace the patient, but in vain.

The tooth specimen has got two crowns, one on the head and the other on the tail end of its root (Figure 1). The tooth has a well developed crown with the normal anatomic morphology of a mandibular first premolar on the outset (Figure 2). It has a single root ending on the other side in a less well developed crown having closer morphology to that of the mandibular second premolar (Figure 3). There is no apical foramen seen and instead a foramen is seen within a wide cavity on the cervical third of the root on the buccal surface directly opening into the pulp canal (Figure 4) and (Figure 5). There is no developmental groove or depression seen separating these two crowns. The crown on the apical end shows a poorly developed crown pattern of a three cusped mandibular second premolar with a prominent mesiolingual cusp (Figure 6). The enamel on the apical crown is incompletely formed having irregular surface and with a depression in the centre.

The intra oral periapical radiograph taken of the tooth specimen revealed a common root canal with crowns on either side (Figure 7). The radio density of enamel of the crown on the apical end was comparatively poor to that of the normal enamel and the thickness was also found to be less, although the crown on the coronal end was appearing quite normal. A radiolucent 'v' shaped notch was seen on the buccal surface more closely to the crown on the coronal end with its broad base on the surface and its narrow apex towards the pulp and also contiguous with it.

A prominent pulp horn can be seen towards the buccal side of the coronal end crown with a large pulp chamber and a wider pulp canal. The pulp canal seems to taper

towards the apex with the pulp chamber area being partly obliterated on the apical crown.

Discussion

Fusion involves epithelial & mesenchymal germ layers resulting in irregular tooth morphology². The etiology of fusion is still an enigma and many different views have been put forward. Shafer et al speculated that pressure produced by some physical force prolongs the contact of the developing teeth causing fusion. Lowell and Solomon believe that fused teeth result from some physical action that causes the young tooth germs to come into contact, thus producing necrosis of the intervening tissue and allowing the enamel organ and dental papilla to fuse together. Many authors have also suggested hereditary involvement as an autosomal dominant trait with reduced penetrance³. Environmental factors have also been implicated in the etiology of fusion. Thalidomide embryopathy may include dental fusion and Knudsen has produced the anomaly in animals treated with trypan blue and high doses of vitamin A⁴. Genetic predisposition and racial differences have also been reported as contributing factors².

Double teeth are two separate teeth exhibiting union by dentin and (perhaps) their pulp^{16, 17}. In our case as there are two heads one on either end of the tooth, the union may be the result of fusion of two separate tooth buds. The second tooth bud could be of a second premolar's which is supposed to be present adjacent to the first premolar have undergone some sort of trauma or physical pressure getting displaced upside down right beneath it. On the other hand, as there is an entity called inverted supernumerary tooth¹⁵, we cannot rule out the possibility of an inverted supernumerary premolar arising from an additional tooth bud in that location fused

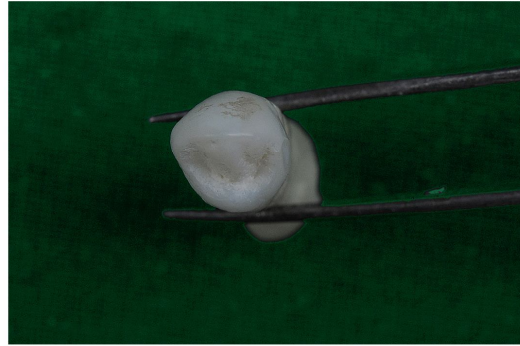
to the normal upright positioned developing first premolar. This very abnormal positioning of the second tooth bud directly beneath the first premolar during its development could have resulted in this unique and rarest of the rare phenomenon of double headed premolar tooth in the mandibular arch. There is union of dentin and their pulps making this developmental pathology a fusion rather than a concrescence which is union only by the cementum.

To summarize, the authors think of two possibilities for such a tooth morphological anomaly. The first possibility is that of the fusion between the mandibular first premolar with an inverted supernumerary tooth and the second is that of the fusion of first and the second premolars on the same side. Either way it is highly a rare coincidence for the second tooth to get fused upside down right at the apical end of the first tooth and develop in that position. Nature has its own way to modify and accommodate to the given circumstances. The tooth has survived its life through a developmental accessory foramen opening on the buccal side of cervical third of the root as there is no apical foramen available. The pulpo-periodontal pathology initiating through the cervical foramen could have been the etiology for the pain and mobility of the tooth and there by extraction of it.

The double teeth (fusion) are usually seen in higher frequency in the anterior maxillary regions. The overall prevalence of fusion is more in the deciduous teeth than the permanent dentition^{16, 17}. This specimen was seen in the mandibular posterior region in the permanent dentition¹. The union of two adjacent tooth buds resulting in fusion with a large crown or a bifid crown with common root and root canal has already been reported^{16, 17}.



[Fig1 mesial aspect.jpg](#)



[fig2 occlusal aspect.jpg](#)



[Fig3 lingual aspect.jpg](#)



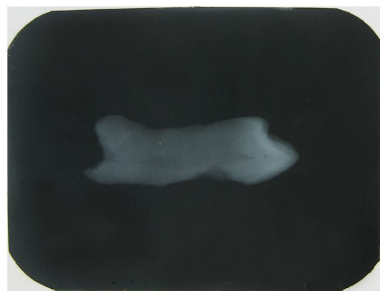
[Fig4 buccal aspect.jpg](#)



[Fig5 double headed mandibular premolar with cervical foramen.JPG](#)



[Fig6 apical aspect.jpg](#)



[Fig7 iopa radiograph.jpg](#)

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