CASE REPORT

Fusion of mandibular permanent second molar and a paramolar: A rare entity

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ABSTRACT:

Dental fusion also called as synodontia is a rare dental developmental anomaly in which the union of two independently developing primary or permanent tooth buds occurs. It may be complete with the formation of an abnormally large tooth or incomplete with the union of crowns or roots only depending on the stage of development. Exact etiological factors are still unclear. There are very few reported cases of fusion of permanent molar and paramolar in the literature. The overall prevalence of the tooth fusion is approximately 0.1% in permanent dentition and more commonly seen in maxillary incisors (3.55%) followed by the mandibular third molars (0.91%). Here, a rare case of fusion between mandibular permanent second molar and a paramolar in a 12?year?old male is presented. Early diagnosis is important to avoid various complications such as compromised aesthetics, carious exposure, space loss, midline shift, and periodontal problems.

Key words: Double teeth, Fusion, Gemination, Paramolar.

INTRODUCTION

Fusion is the union of two teeth with normally separated tooth buds leading to the formation of a joined tooth with confluence of dentin. Fusion of teeth is a rare developmental anomaly which occurs due to union of two independently developing tooth buds.[1] The fusion may be partial or total depending on the formative stage of the involved teeth. In fusion atleast two ducts and two roots for the same pulpal chamber will be seen.[2] Different terms such as “connate teeth,” “double formations,” “synodontia,” or “joined teeth” are often used to describe fused teeth.[3] It is often hard to differentiate fusion from other developmental anomalies like gemination, especially if the supernumerary tooth bud is fused with the adjacent one. Gemination is defined

as an attempt of single tooth bud to divide with the resultant formation of a tooth with a bifid crown and usually demonstrates common root and root canal.[3] The frequency of occurrence of fusion is more common in primary teeth than in permanent dentition, with high frequency in anterior maxillary region (3.55%) and with rare occurrence in the mandibular posterior region (0.91%).[4] Fusion may also occur between a normal tooth and supernumerary tooth. The overall prevalence appears to be approximately 0.5%-2-5% in deciduous teeth and 0.1% in permanent dentition.[5]

The etiology of fusion is uncertain. The etiology may be attributed to evolution, trauma, heredity, viral infection during pregnancy and environmental factors.[6] It has been stated that fusion results when two tooth germs develop so close together that, as they grow, they come into contact and fuse before calcification. Other researchers state that external physical pressure of force generated during growth lead to the young tooth germs to come in contact and fuse.[7] According to the other authors, fusion is a result of persistence of interdental lamina between the two buds during embryological development.[3] Environmental factors have also been implicated in the etiology. Thalidomide embryopathy may induce dental fusion. Authors have reported anomaly in animals treated with trypan blue and high doses of vitamin A.[6] Genetic basis for fusion is based on a autosomal dominant trait with reduced penetrance. Syndromes commonly associated with double teeth are Wolf–Hirschhorn syndrome, achondroplasia, focal dermal hypoplasia, osteopetrosis, and chondroectodermal dysplasia.[6]

Fused teeth are usually asymptomatic but can cause esthetic appearance due to irregular morphology. However, when deep grooves are present, these teeth are susceptible to caries and periodontal disease. The purpose of this article is to report a rare case of fusion of permanent mandibular second molar and a paramolar.

CASE REPORT

A 12 year old boy reported to the department of Pedodontics & Preventive Dentistry, with a chief complaint of large tooth in lower left back region. A detailed history was obtained. The patient had no significant medical and dental history and family history did not reveal any evidence for hereditary dental anomalies. Intraoral examination revealed localized macrodontia of lower left second permanent molar [Figure 1& 2]. Examination of the large tooth showed three additional cusps on buccal surface; a large distal cusp, a smaller mesial cusp and a smallest cusp between these two cusps. Clinically it was differentially diagnosed as either fusion of a paramolar with 2nd permanent molar or incomplete germination of 2nd permanent molar.

To confirm the status of the tooth, Intra Oral Periapical radiograph and panoramic radiographs were taken. Intraoral periapical radiograph revealed the presence of two crowns which were fused by enamel and dentin with separate roots. Two roots of second molar and other two of the paramolar were seen. Based on radiographic findings it was diagnosed as fusion of mandibular second molar and a paramolar. [Figure 3& 4].

DISCUSSION

Developmental anomalies of teeth may seen due to abnormalities in the differentiation of the tooth germs or abnormalities in the formation of the dental hard tissues.[8] Fusion is the union of two normally separated tooth buds leading to the formation of a joined tooth with confluence of dentin. It can be categorized into two types, complete and incomplete. A complete fusion takes place when it begins before calcification and the fused teeth consists of features of both participating teeth in relation to enamel, dentin, cementum, and pulp. Incomplete fusion occurs at a later stage of tooth development. The fused tooth exhibit separate crowns, and roots and root canals.[3] This case revealed fusion of two teeth

involving the coronal surfaces with two separated roots and distinct pulp chambers and canals.

Fusion most commonly occurs in deciduous teeth (0.5-2.5%) in comparison to permanent tooth (0.1%) with more predilections for anterior teeth. It can be unilateral or bilateral also fusion may occur either between two normal teeth or between a normal tooth and a supernumerary tooth. It is very difficult to differentiate between fusion and gemination by clinical examination, especially when fusion takes place between normal tooth and a supernumerary tooth. But there is a difference between fusion and gemination. The differences between fusion and gemination are listed in table I.[9]

The potential problems associated with fused teeth include abnormal shape of the tooth leading to unaesthetic appearance, occlusal disturbances, and space discrepancies. The presence of deep fissures or grooves at the union between fused teeth predisposes it to caries and periodontal disease. In our case, deep pits and fissures on palatal surfaces of teeth led to carious exposure and pulpal involvement and endodontic treatment was done. So thorough knowledge of the existence and morphology of this anomaly helps to adapt multidisciplinary treatment approaches depending on separate pulp chambers and canals or one pulp chamber and two canals.[10]

Various treatment options have been discussed in the literature to manage the clinical problems associated with fused teeth. The treatment of choice depends upon the patients orthodontic, periodontal, esthetic, and functional requirements. When the pulp and canals are separated, approaches like: (a) The separation and extraction of the anomalous tooth with orthodontic closing of the space and reshaping of the teeth, (b) surgical separation and restoration of both teeth, and (c) selective grinding of the fused teeth to reduce the crown width have been suggested.[5]

CONCLUSION:

The frequency occurrence of fusion in permanent teeth is approximately 0.1%. Its occurrence in mandibular posterior region is very rare (0.91%). Identifying a case of asymptomatic developmental anomaly like fusion is essential as it affects esthetics, arch symmetry, and occlusal harmony. The complex morphology of fused teeth could predispose it to dental caries and periodontal diseases and may sometimes compromise pulp vitality. Successful management of these cases depends on the morphology of fused teeth and knowledge and skills of the practitioner.

Table I: Differences between fusion and gemination

Fusion	Gemination
Union of two normally separated tooth buds resulting in a joined tooth with confluence of dentin.	Partial division or twinning of single tooth germ resulting in a tooth with a bifid crown.
Occurs as a result of physical forces or pressure causing the contact of developing tooth germ.	Occurs as a result of abnormal odontogeny.
Tooth count reveals a missing tooth when anomalous tooth is counted as one.	Tooth count is normal when anomalous tooth is counted as one.
Exhibits abnormal-shaped tooth with an unusually wide crown	Exhibits two separate or partially separated crowns.
Separate roots and root canals are present	Single root and root canal are present.

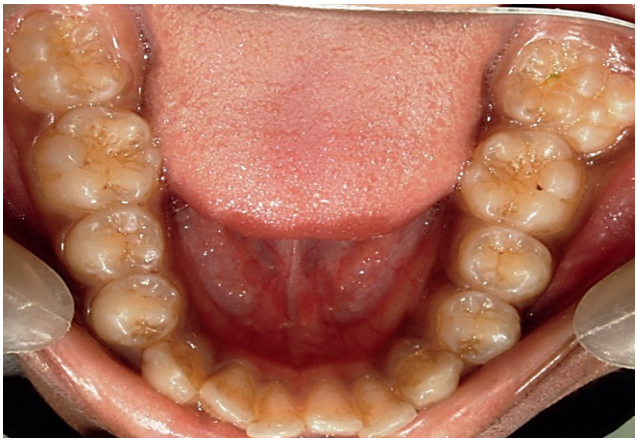

Figure I: Photograph showing macrodontia of 37

Figure II: Photograph showing 37 in occlusion

Figure III: Intraoral periapical radiograph showing fused paramolar

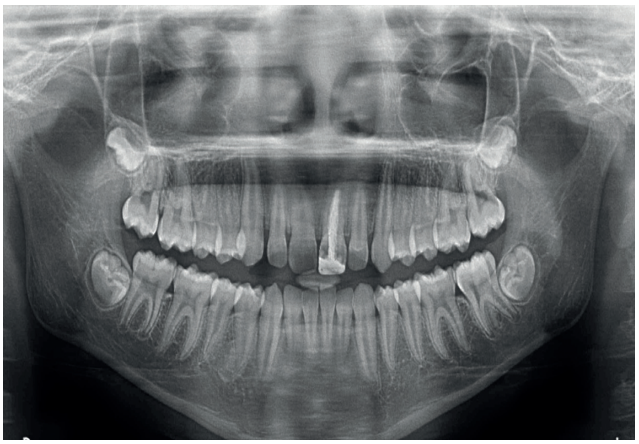

Figure IV: OPG showing complete set of teeth

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