

Case Report

Fusion of Left Primary Mandibular Lateral Incisor and Canine in a Seven Year Old Male Child: A Case Report

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Abstract: Double or fusion of the teeth is a primary developmental anomaly union of two independently developing primary or permanent teeth. The tooth fusion may contribute to various significant problems such as crowding, caries and periodontal diseases and they may be associated with anomalies in the succeeding permanent dentition which necessitate careful examination & proper treatment planning because treatment of these anomalies is clinically demanding. Fused teeth require an interdisciplinary approach combining the endodontic, esthetic and prosthetic treatments. We report a case on fusion of left mandibular deciduous lateral incisor and canine in a seven year old male child.

Keywords: Double teeth, dental anomaly, fusion, gemination

INTRODUCTION

Dental anomalies of number and forms may occur in the primary and permanent dentition. The terms such as 'double tooth', 'joined teeth', or 'fused teeth' are often used to describe gemination and fusion, both of which are primary developmental abnormalities of the teeth. Double teeth refer to two teeth that are totally or partially joined by dentin and may be there pulp. These abnormal teeth are the result of gemination or fusion that coined by Levitas[1]. Gemination is a result of either schizodontism, the splitting of a tooth germ during development or synodontism, the fusion of a normal tooth bud with another one or with a developing supernumerary tooth. It has been thought that some physical force or pressure produces contact of the developing teeth and there subsequent fusion[2]. Fusion of adjacent teeth can be complete or incomplete, depending on the stage of tooth development at the time of contact. True fusion always involves confluence of dentin. Fusion tend to occur in anterior region and the incisors are the teeth most often affected in the permanent dentition and in the primary dentition majority of cases involve anterior mandibular teeth. Double teeth are more common in the primary than in the permanent dentition, the prevalence in different series ranging from 0.5% to 2.5% for the primary and 0.0 ~ 0.8% of the general population with no gender predilection for the permanent dentition [3]. In 1963 Tannenbaum and Ailing, defined gemination as the formation of the equivalent of two teeth from the same follicle, with evidence of an attempt for the teeth to be completely separate, this indicated clinically by a groove or depression which could delineate two teeth.

Radio graphically, there appears to be only one pulp chamber. They stated that in gemination, if the bifid tooth is counted as one entity, the total number of teeth in the dental arch is otherwise normal.

The same authors' defined fusion as a union of two separate tooth buds at some stage in their development [4]. Fused teeth have separate or shared pulp chambers and canals. There will be one less tooth in the arch than normal if the affected tooth is counted as one. Fused teeth arise through union of two normally separated tooth germs, and depending upon the stage of development of the teeth at the time of union, it may be either complete or incomplete. Depending on the stage they are united, one tooth may have only one pulp chamber as a gemination, or there may be two pulp chambers, with union only of the dentin. The phenomenon of gemination arises when two teeth develop from one tooth bud and, as a result, the patient has an extra tooth, in contrast to fusion, where the patient would appear to be missing one tooth. According to reports, gemination and fusion are common among Asian children. About five percent of the children in the population are affected by it. And there are about 0.5 percent up to 2.5 percent of Caucasian children that are affected by gemination and fusion [5].

CASE REPORT

A seven year old male child reported to Department of Oral Medicine, Diagnosis & Radiology of Institute of Dental Education & Advance Studies, and Gwalior with chief complaint of yellowish discoloration

of teeth since 3 months. Oral examination revealed the patient was in the early mixed dentition. The mandibular arch revealed an asymmetry in the tooth number. There were three primary teeth on the left side along with first permanent molar and central incisor i.e., 73 was missing. There were four primary teeth along with first permanent molar & central incisor on the right side. The mandibular left primary lateral incisor & cuspid were present along with an enlarged bifid crown i.e., 72 and 73.

An incisal ditch was seen between 72 and 73 exhibiting the fused left primary lateral incisor and canine teeth with a small groove up to the incisal third of crown in between them where they are not in contact, corresponding to the outline of the originating teeth giving a diagnostic dilemma of germination (Figure 1 & 2). There were no soft tissue changes in relation to involved tooth. If incompletely fused teeth were considered as one tooth then count of dentition was considered one less than normal. Radiographic examination (Figure 3) indicated the presence of separate root canals and roots. Intra oral radiograph revealed normal permanent successors.



Fig 3: Intraoral periapical radiographic revealing the fused primary mandibular left central and lateral incisor



Fig 1: Intraoral view of the fused primary mandibular left central and lateral incisor



Fig 2: Occlusal view of the fused primary mandibular left central and lateral incisor

DISCUSSION

The present case illustrates the frequent confusion of identification between fusion and gemination. In the present report the term fusion is used, in accordance with the definitions used by Levitas" who stated that "by appearance it would seem that there is a missing tooth and probably two root canals [6]." Fusion of the primary lateral incisor and cuspid might result in early loss of the cuspid with potential loss of arch length or midline shift. To prevent this complication, preservation of arch space and form should be considered. Fused primary teeth present several problems to the clinician. Since exfoliation times are usually different for each tooth involved in the fusion, consideration should be given to the variations in root resorption. The presence of primary double tooth could also cause delayed resorption of root due to greater root mass and increased area of root surface relative to the size of the permanent successor crown. This may lead to delayed or ectopic eruption of the permanent successor. In spite of considerable number of cases reported in the literature, the differential diagnosis between fusion and gemination is difficult. Proper case history, clinical and radiographic examinations can update the information required for the diagnosis of such abnormalities [7].

Several clinical and radiographic benchmarks are used to distinguish fusion from gemination. Fusion is the incomplete attempt of two tooth buds to fuse into one; however gemination is the incomplete attempt of

one tooth bud to divide into two. Clinically, the crowns of the teeth appear to be held tighter, with a small groove between the mesial and distal sections, but on the fused teeth radiographs, there will be two distinct pulp chambers and if the fused tooth is counted as one unit, there will be one less tooth in the arch than normal. In cases of gemination, radiographically there is only one pulp chamber and the anomalous tooth is counted as one unit, the number of teeth in the arch will be normal. Gemination may be differentiated from fusion by the increased number of teeth, except in unusual cases in which the fusion is between a supernumerary tooth and, a normal tooth [8]. Macrodonia is a condition in which any tooth or teeth appear larger than normal for that particular type of tooth. True macrodonia that involves the entire dentition is rare. It is more common that there is an enlargement of a single tooth due to a disturbance of morphodifferentiation. Since double teeth are obviously wider than the circumjacent teeth, esthetics may be a concern. When normal teeth fuse, excess dental space can result. This can result in diastema formation. When fusion occurs in the primary dentition, some of the permanent incisors often are not present. These problems require both cosmetic and orthodontic consideration [9].

The etiology of double teeth may be attributed to evolution, trauma, heredity and environmental factors [10]. Fusion is believed to occur due to physical force or pressure on adjacent tooth germs, which lead to their contact and fusion before calcification. Although the etiology of gemination is unknown, there is some evidence that the condition has a familial tendency [11].

Other authors consider a viral infection during pregnancy and the use of thalidomide as possible causes of the anomaly [12]. Although the etiology is still not clear, there is strong evidence for genetic control of fused teeth as evidenced in family and twin studies. Fusion has also been reported with congenital anomalies like cleft lip. It is also seen with S-linked congenital condition. Some dental and non-dental abnormalities have been associated with double defects. These include: supernumerary teeth, hypodontia, peg-shaped permanent maxillary lateral incisors, dens in dente, nail disorders, syndactyly, successional conical, macrodonia and double permanent teeth. Double teeth may also be part of syndromes such as achondrodysplasia and chondroectodermal dysplasia. They can also be seen unilaterally or bilaterally in either the maxillary or mandibular dentition [13]. Brook *et al* reported that half of the primary double teeth have been followed by an anomaly in the permanent dentition and family histories of hypodontia or supernumerary teeth were found in some cases [14]. Kolenc Fuse reported that genetic linkage and molecular biology studies allowed the identification of mutation responsible for

some patterns of syndromic and nonsyndromic tooth agenesis. The most common problem related to double teeth is hypodontia of the permanent dentition and it has been observed in 50% of affected subjects [15]. Aguilo *et al* reported that double teeth were frequently unilateral, involving two adjacent teeth and no difference was found in the proportion of double teeth in either the mandible or maxilla, or on the right or left side [16]. White *et al* reported that when a deciduous canine and lateral incisor fuses, the corresponding permanent lateral incisor may be absent. Gellin reported that the effected permanent successor was up to 100% when double primary teeth involved the lateral incisors and cuspids [17].

MANAGEMENT

There are different treatment approaches of cases with double teeth. If the affected teeth are primary, they may be retained as they are. The patient's expectations and degree of compliance must also be accurately assessed when determining suitable management. If the fused tooth is free from caries, it may require no particular treatment. Universal preventive advice should be given to the parent and the child and if caries already exist, a restoration should be made. In a preventive concern, the buccal and lingual vertical grooves of double primary teeth may be pronounced and difficult to clean, and are highly susceptible to caries and periodontal disease. The placement of fissure sealants or composite restorations in these grooves should decrease the caries risk. Surgical division of the double teeth can be carried out when the degree of fusion is mild. When dividing double teeth, the complicated dental canal system should be evaluated cautiously [18]. If there is pulpal involvement, endodontic treatment should be carried out in the same way as for a multirrooted tooth. If the clinician plans extraction, it is important to determine first whether the corresponding teeth are present. The extracted teeth can be replaced with an interim removable partial denture until they can be replaced with a fixed bridge or an implant. Dental anomalies of number and forms may occur in the primary and permanent dentition, leading to orthodontic, including spacing or crowding of teeth, loss of arch length, esthetic problems increased caries risk, and deviation of the midline in preschool children. Tooth gemination and tooth fusion can cause crowding of the teeth making the permanent teeth difficult to erupt. In some cases, a dentist needs to remove the double tooth in order to let the permanent teeth erupt. Orthodontic management should be considered to ensure functional occlusion and advance esthetics [19].

CONCLUSION

Fused teeth are frequently observed during routine oral examinations. A thorough clinical and radiographic evaluation is essential to confirm its

presence in the primary dentition. Radiographs help in making precise diagnosis and formulating the right treatment plan as fused teeth in primary dentition may be associated with anomalies in permanent dentition. Hence it becomes imperative to recognize this dental anomaly at the earliest and establish a right treatment plan. Careful monitoring is required for diagnosis of double teeth, since problems with exfoliation can occur, along with caries formation in the groove of the incompletely formed double teeth. Although primary double teeth themselves may be regarded as harmless anomalies, their presence can cause some space problems, occlusal disturbance, and delayed eruption of the permanent successors.

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