

Bilateral Gemination: A Case Report

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ABSTRACT

Most common Developmental disorders characterized by morphological changes in the shape of teeth are fusion and gemination. Even though both gemination and fusion are commonly seen, there is always a dilemma in diagnosis when teeth are congenitally missing or supernumerary teeth are present. Compared with unilateral gemination bilateral gemination is comparatively rare. Here we are discussing a case of bilateral gemination of maxillary canine of a 12-year-old female, the history, clinical and radiological importance of diagnosing these cases along with differentiating features of various developmental alterations in the shape of teeth.

KEYWORDS: Developmental Tooth Disorder, Gemination, Fusion

INTRODUCTION

Developmental dental disorders are due to abnormalities in the differentiation of the dental lamina and the tooth germ. Developmental anomalies can occur due to congenital, inherited, acquired or idiopathic cause, which can result in abnormalities involving tooth number, size, shape and structure.¹ Gemination is defined as a single enlarged tooth formed by partial division of a single tooth bud and fusion results from the conjoining of two tooth buds². These anomalies are not a regular finding in routine dental practice and if present, terms “double tooth”, “double formations”, “joined teeth”, or “fused teeth” are often used.²

In clinical situations, cases of fusion have the appearance of a congenitally missing tooth, whereas in gemination the number of teeth in the dentition is normal, provided the double tooth is counted as one unit. Radiographs are generally used to assess the level of abnormality in this condition. Geminated teeth are commonly found in the maxilla, while fusion is frequently found in the mandible. As a general rule, when the affected tooth is regarded as one, if in the arch there is one tooth less than the normal count it is called fusion, while when the normal number of teeth is present it is termed gemination, as suggested by Duncan and Helpin.³ According to literature, gemination occurs more in primary dentition (0.5% prevalence in children) than in permanent dentition (0.1% prevalence in adults). Predilection is more in maxillary primary incisors and canines. The frequency of a bilateral gemination is 0.02 % in both dentitions and present more frequently in the Mongolian race (5%) than in the Caucasian race (0.5%).⁴

Along with the esthetic problems, these developmental anomalies can cause both malalignment and malocclusion. Disproportionate sizes of the maxillary and mandibular teeth creates interarch tooth size discrepancies. One of the major criteria for good occlusion is that the teeth must be proportional in size.

An interarch tooth size discrepancy of less than 1.5 mm is of little significance, whereas larger discrepancies pose treatment problems.⁵ In such cases if the large upper teeth are combined with small lower teeth, an ideal occlusion is difficult to achieve. Considering these facts, we clearly understand the esthetic, functional and diagnostic importance of the present case.⁶

CASE REPORT

A 12-year-old girl presented to the department of oral medicine and radiology with the complaint of forwardly placed upper front teeth. Her past dental, medical and family history were noncontributory. Intraoral clinical examination revealed that the patient was having permanent dentition. The upper arch showed abnormally wide teeth in relation to 13 and 23 from labial as well as incisal aspect. The right canine showed a groove on the labial surface extending from incisal edge to cervical one-third on both labial and palatal surface. There was neither a change in color nor evidence of dental caries for the related tooth (figure 1, 2). Similarly, in relation to left



Figure1 clinical photograph showing 13

canine another groove along the center, cervical directed was found which was limited to incisal one-third. She also was having Angles class II division 2 malocclusion with deep bite and crowding of upper teeth. Occlusal

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Figure 2: Clinical photograph of bilateral macrodontia

view clearly show the discrepancy in the morphology of both the canines (figure 3).

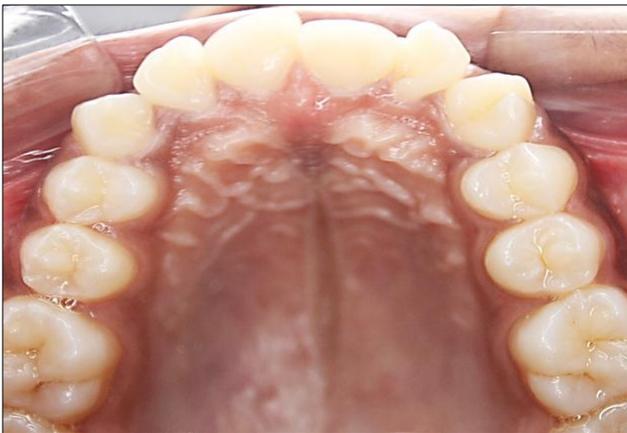


Figure 3: maxillary occlusal view

Intra oral periapical radiograph revealed large pulp chamber in relation to 13 and a thin radiolucent line, which shows partial separation of the crown. In relation to 23, the separation of coronal portion is not clearly visible. Nevertheless, we could appreciate the presence of enlarged pulp chamber (figure 4, 5) in both the canines. Radicular volume of both 13 and 23 were within normal limits. Panoramic radiographic examination (Figure 6) disclosed an otherwise complete dentition, except for the findings related to bilateral upper canine.



Figure 4: IOPA Of 23



Figure 5: IOPA Of 13



Figure 6: Panoramic Radiograph

Morphological alterations can act as surface irregularity causing plaque accumulation, which leads to dental caries. These sequelae should always be a major concern in treatment planning. Since the guardian's prime concern was about esthetics, the patient was advised preventive resin restoration and fixed orthodontic treatment.

DISCUSSION

Numerous cases have been documented regarding the occurrence of both gemination and fusion, but still there is confusion regarding nomenclature and the diagnosis. Some authors have tried to differentiate them by counting the teeth or by observing the root morphology; others use fusion and gemination as synonyms. Finally, Brook and Winter simply called the phenomenon 'double teeth' or 'connated teeth' to avoid confusion over terminology.⁷

The "TWO TOOTH RULE" according to Mader (1979) states anomalous tooth is counted as two teeth; if teeth count is normal in the arch, then it is considered as fusion. In cases where the anomalous tooth is counted as two teeth and if an extra tooth is present in the region, then it is regarded as gemination or a fusion between a normal and a supernumerary tooth.⁹ However, fusion can also be the union of a normal tooth bud to a supernumerary tooth germ. In such cases, the tooth number is normal, and differentiation from gemination is seldom possible. In the present case, we could clearly see the morphological alteration of both the maxillary canines, where 13 shows a definite groove running vertically till the cervical region on both labial and palatal aspect. Whereas 23 showed only a minor, notching of the

incisal edge. Clinical examination revealed normal compliment of teeth and on radiographic examination, the widening of pulp chamber could be appreciated. Considering these facts, we diagnosed this case as bilateral gemination of maxillary canine.

According to Aguilo et al., gemination is given in (table 1).

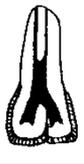
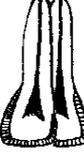
Type 1	Enlarged crown with notch on the incisal edge, pulp chamber can be bifid, normal radicular dimension, cervical widening of canal	
Type 2	Straight /normal incisal edge, large pulp chamber and root canals with increased radicular dimension	
Type 3	Two fused crowns, with complete or partial vertically running groove, which extends cervically. Coronal portion may or may not be symmetrical. Pulp chamber coronally can be fused or shared but end as two separate canals	
Type 4	Two separate crown with separate root and canals	

Table 1- classification of gemination

The above discussed case is similar to type 1 category with respect to incisal aspect but radiographically both the maxillary canines have only enlarged pulp chamber without any bifid appearance.

Depending upon the stage of development of the teeth at the time of the union or division, both gemination and fusion could be either complete or incomplete. On certain occasions, two independent pulp chambers and root canals can also be appreciated. The major differentiating for features among gemination, fusion twining and concrescence is given in (table 2).

Complications that follow a gemination are many. The teeth affected could be morphologically abnormal and so unaesthetic.¹¹ Deep buccal and lingual grooves extending subgingivally favors plaque accumulation causing dental caries and periodontal diseases.¹¹ The complex tooth morphology, pulpal anatomy, tooth position cause difficulty in rubber dam placement, which may invalidate endodontic treatment and necessitate surgical removal of the affected tooth. Gemination of primary teeth can lead to malformation, impaction, delayed, or altered path of eruption of permanent successors.¹² In relation to the above-mentioned case esthetics was the major concern so the treatment option suggested was two-phase

orthodontic treatment using myo-functional appliance and finally ceramic veneer for morphological correction

Abnormality	Etiology	Clinical features	Radiograph
Fusion	<ul style="list-style-type: none"> Fusion of two adjacent tooth buds 	<ul style="list-style-type: none"> More common in mandible Reduced number of teeth 	<ul style="list-style-type: none"> Unusual configuration of pulp chamber or root canal Level of fusion can be detected
Gemination	<ul style="list-style-type: none"> Partial splitting of single tooth bud 	<ul style="list-style-type: none"> More common in maxilla Normal tooth number 	Radiopaque enamel outlines the clefts in the crowns
Twining (terminology is debatable)	<ul style="list-style-type: none"> Complete splitting of a single tooth bud to form supernumerary 	<ul style="list-style-type: none"> Tooth number is increased Normal tooth and supernumerary present 	<ul style="list-style-type: none"> Two separate teeth can be seen
Concrescence	<ul style="list-style-type: none"> Two fully formed teeth, joined along the root surfaces by cementum. Due to trauma or pressure because of limited space 	<ul style="list-style-type: none"> Normal tooth number Diagnosed radiographically 	Union by cementum can be noticed.

Table 2- Etiologic clinical and radiologic difference among gemination, fusion twining and concrescence.

CONCLUSION

Double teeth can cause esthetic problems, occlusal disturbances and if the primary teeth are affected it could delay the eruption of permanent teeth. So a careful monitoring of this condition is recommended. A detailed case history, clinical and radiological examination will provide necessary information needed for the diagnosis. Dental practitioners should always consider the possibility of conservative treatment before the occurrence of a more complex pathology.

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