Bilateral Fusion of Permanent Mandibular Incisors: A Rare Developmental Anomaly

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Fusion is a rare developmental anomaly. The prevalence ranges from 0.5% to 5% based on geographic, racial, or genetic factors, which occur as a result of physical force or pressure leading to prolonged contact of the adjacent tooth follicles thus resulting in the fusion of tooth buds. Bilateral fusion of teeth has been reported to be very rare as compared to unilateral fusion which is around 0.05%. Although asymptomatic, they can be a predisposing factor for caries and cause periodontal problems due to malalignment in the arch. The aim of this article is to present a rare case of bilateral fusion of mandibular anterior teeth and discuss the possible histogenetic mechanism and future treatment perspectives.

Keywords: Dental anomaly, Fusion, Gemination, Permanent dentition, Prevalence

INTRODUCTION

The term connation has been used in literature to describe “double teeth” which could be the result of either fusion or germination.¹ The terms “double formations,” “fused teeth,” “dental twinning,” “schizodontia,” “synodontia,” “gemini fusion,” “vicini-fusion,” and “joined teeth” have also been used alternatively to define the presence of two teeth conjoined to each other.² Pindborg defined fusion as the union between dentin and/or enamel of two or more separate tooth germs and gemination as the division of a single tooth germ resulting in a bifid crown, and single root.³ Clinically, fusion and germination can be differentiated by counting the number of the teeth in the arch. In case of fusion, there is hypodontia if the affected tooth is counted as one,⁴ whereas, in case of germination, there is normal number of teeth present in the arch if the geminated tooth is counted as one.⁵ Fusion is more common in primary dentition with a prevalence of approximately 0.4%-0.9%⁶ in primary, whereas, in permanent dentition, it has been reported to be about 0.2%⁷ only. Bilateral fusion of teeth has been reported to be very rare as compared to unilateral fusion which is around 0.05%.⁸ Fusion is a rare developmental anomaly. The prevalence ranges from 0.5% to 5% based on geographic, racial, or genetic factors,⁹ which occurs as a result of physical force or pressure leading to prolonged contact of the adjacent tooth follicles causing fusion of tooth bud.¹⁰ The incidence of fusion has been reported to be higher in anterior maxillary anterior region either in primary or permanent dentition.¹¹ Although asymptomatic, they can be a predisposing factor for caries and cause periodontal problems due to malalignment in the arch. Furthermore, if present in the anterior region, they appear clinically as a large crown with increased mesiodistal width which poses esthetic problems for the patient. Fusion may occur either between the teeth of same dentition, teeth of permanent dentition with supernumerary teeth or between permanent dentition and mixed dentition.

The aim of this article is to present a rare case of bilateral fusion of mandibular anterior teeth and discuss the possible histogenetic mechanism and future treatment perspectives.

CASE REPORT

A 24-year-old male patient reported to the department of oral medicine and radiology with the chief complaint of pain and sensitivity in the upper front region of jaw since 1 month. The medical history of the patient was noncontributory. Thorough family history of the patient...
was obtained, and it did not reveal any congenital dental anomalies. Intraoral examination revealed that the patient had permanent dentition. Carious lesion was present on the mesial and distal aspect of 21 and the mesial side of 22. In the mandibular anterior region, two large incisors were noted which had abnormally increased mesiodistal dimension (Figure 1). On the labial aspect of both the incisors, a labial groove was present which was running down from the incisal edge to the middle-third of the tooth. The right incisor was lingually rotated, and plaque accumulation was present with the same. Due to the increased mesiodistal dimension of both the incisors crowding was present with respect to the mandibular anteriors. On careful clinical examination, two teeth were found to be missing in the mandibular arch. 14 teeth were present in the lower arch excluding the lateral incisors. An IOPAR was advised for the mandibular anterior region and maxillary anterior region which was the chief complaint of the patient. IOPAR revealed that both the mandibular incisors had single root (Figure 2). In the right incisor, two root canals were present. In the left incisor, two separate root canals were seen which joined each other after the cervical third of the root to form a single canal. An ill-defined radiolucency was also seen on the distal aspect of the right incisor, near the cervical portion indicative of carious lesion. OPG disclosed a complete set of permanent dentition with no retained deciduous or impacted permanent teeth except for the absence of missing lateral incisors (Figure 3).

In the maxillary arch, deep caries was present on the mesial and distal aspect of 21 and on the mesial aspect of 22.

**DISCUSSION**

Dental developmental anomalies occur as a result of aberrations in the differentiation of the dental lamina and the tooth germs or irregularities during the development of hard tissues. Although the literature on the presence of double teeth is extensive, a great degree of disagreement exists regarding the nomenclature. Some authors have tried to classify it by counting the number of teeth using “Madder’s two tooth” rule. This rule states that in the case of fusion the total number of teeth in the dental arch is reduced if the fused teeth are to be counted as one. However, in case of germination, the number of teeth in the arch remains the same if the affected teeth are counted as one. In case of fusion between a supernumerary tooth and a normal tooth, it can be noted that supernumerary tooth is usually cone shaped or have aberrant morphology, thus the two halves of the crown in case of fusion will not be same. However, in case of gemination, the two halves of the crown are mirror images of each other, and a buccolingual groove will be extending till the incisal edge. Some authors have also proposed that fused teeth have a separate root canal, whereas geminated teeth have a single root canal. Furthermore, geminated teeth have been more frequently reported in maxilla, whereas fused teeth have been reported commonly in the mandible. Considering these criteria, the double teeth in the present case have been named as “Fused Teeth.” The differential diagnosis of fused teeth includes germination and macrodontia.

There is no single school of thought regarding the etiology of fusion. While some researchers report that this anomaly results when two tooth buds come in close contact with each other by resorbing the interdental bone, and then, they
subsequently fuse with each other before calcification. Others believe that adjacent tooth germs come in contact with each other due to physical pressure. It has also been proposed that fusion may occur as a result of crowding between adjacent tooth germs. Genetic inheritance might also be considered a possible cause. Some investigators also considered viral infection and thalidomide intake during pregnancy as the possible cause of fusion. A study conducted on mouse embryos reported hypervitaminosis A as the possible cause for this dental anomaly.

Fusion can be classified into two types: Complete and partial depending on the stage of development of the tooth. If the process of fusion occurs before calcification, the crown of the affected teeth exhibits the features of both the participating teeth, whereas if fusion occurs post calcification, the affected teeth display distinct crowns and only the roots might be fused with pulp canals either fused or distinct. In the present case, the roots of both the teeth have distinct pulp canals with a single root indicating complete fusion of roots. However, the crowns of both the affected teeth were bifid clinically, with labial groove. Thus, this can be considered a case of bilaterally incomplete fusion.

The presence of double teeth is also associated with syndromes such as chondroectodermal dysplasia, Wolf-Hirschhorn syndrome, focal dermal hypoplasia, achondroplasia, and osteopetrosis.

Another very important clinical application is diastema formation in the anterior region owing to the fusion of two normal permanent teeth thus requiring orthodontic intervention for esthetic purposes.

Aguilo et al. have classified double teeth into four morphological types considering both clinical and radiographic appearance. Type I has a single bifid crown, a larger than normal crown with a notch on the incisal edge, a bifid pulp chamber, normal sized root, and radicular canal with widening in the cervical portion. Type II has a large crown and a large root: A larger than normal crown usually with a groove or notch, a single large pulp chamber, a root that is larger than normal along its length and one large shared root canal. Type III has two fused crowns, double conical root while Type IV has fused crowns, double roots, two (or more) clearly distinct but joined roots with two separate canals. The case presented here has a tendency toward type I in the right mandibular anterior region as the pulp chamber is bifid. In the left mandibular anterior region, initially the pulp chamber is bifid but after the cervical 1/3rd region both the root canals appear to get united. Hence, the left mandibular anterior cannot be clearly delineated in the above-mentioned 4 types, though we can state that it as a borderline case between Types I and II.

The management of double teeth depends on the morphology of the tooth and the level of fusion. Usually, a preventive approach and minimal intervention technique are dictated for such patients if the pulp is not involved. In the present case, the patient was not aware regarding this dental anomaly, and it was an incidental finding. Thus, no treatment was rendered to the patient. The patient has been kept on follow up considering the rotated position of the right mandibular anteriors making it susceptible to plaque accumulation and caries. Excavation of caries and restoration was done for the carious lesion on 21, 22.

**CONCLUSION**

Bilateral fusion is a rare dental anomaly with an incidence of 0.5% in the mandibular anterior region. Since the prevalence is very low, the importance of double teeth remains to be underexplored. In such cases, a deep groove may be present as in the present case which might predispose the teeth to caries and periodontal problems. Strict oral hygiene instructions should be given to such patients, and they should be kept under regular follow-up.

Thus to conclude, though the presence of bilateral double tooth in the mandibular anterior region is very rare, they are a very crucial part of dental anomalies as they can lead to several complications, so they must be diagnosed and managed properly.

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