Journal of Rare Cardiovascular Diseases
ISSN: 2299-3711 (Print) | e-ISSN: 2300-5505 (Online)
www.jrcd.eu
RESEARCH ARTICLE

Diagnostic Challenge and Treatment Considerations in a Geminated Deciduous Mandibular Lateral Incisor: A Case Report

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Article History
Received: 12.08.2025
Revised: 16.09.2025
Accepted: 16.10.2025
Published: 13.11.2025

Abstract: Herein, we present a case of a 2-year-old female patient who presented with an asymptomatic, abnormally large mandibular left lateral deciduous incisor (tooth 72, according to the FDI system). Clinical and radiographic assessments confirmed a bifurcated crown over a single root, confirming the diagnosis of gemination. Since the tooth was intact and asymptomatic, conservative management, including fluoride application, oral hygiene education, and biannual follow-up was recommended. Proper differentiation between gemination and fusion is essential. Radiograph and clinical tooth count help in diagnosis. An early diagnosis and routine dental check-up help prevent caries and maintain oral health in patients . Aim: Early diagnosis between gemination and fusion in clinical practice

Keywords: Gemination, Fusion, Double teeth,Dental Anomaly.

INTRODUCTION

Dental Anomalies can present as variations in the number, size, shape, and structure of teeth. 'Double teeth' is a commonly used term for gemination and fusion. These anomalies affecting the shape of the teeth pose diagnostic challenges because they resemble one another despite distinct aetiologies. [1,2]. These anomalies occur due to disruptions in ectodermal and mesodermal tissues during the morphodifferentiation stage of tooth development. The severity of the anomaly depends on the stage of odontogenesis during which the pathology is initiated. This dental anomaly is characterised by incomplete division of a single tooth bud, leading to the development of two distinct crowns that share a common root [3-4]. The diagnosis of gemination depends on clinical and radiographic evaluation. Gemination and fusion are two types of dental shape anomalies that have similar clinical features but different etiologies and treatment considerations. Distinguishing between these conditions is essential for effective treatment planning.

RESULTS AND OBSERVATIONS:

A 2-year-old female patient and her mother reported to our institute with an aesthetic complaint that the patient's lower left front tooth was larger than the other teeth and appeared heart-shaped. The affected tooth was asymptomatic. The patient did not have any past medical or dental history. On clinical examination, all intraoral structures (hard and soft) appeared normal except for the deciduous mandibular left lateral incisor, which exhibited an abnormal bifid crown (Figure 1), having mesiodistally wider dimensions compared to other deciduous anterior teeth.

Figure 1- Intraoral photograph of deciduous teeth showing bifid crown of tooth 72

The total number of deciduous teeth in the oral cavity was 20, thus supporting the clinical diagnosis of gemination rather than fusion. To confirm this, an intraoral periapical radiograph (IOPA) of tooth 72 was taken, which showed a single root and two bifurcated crowns (Figure 2), confirming the radiographic diagnosis of gemination of a left mandibular deciduous lateral incisor.

Figure 2- Intraoral periapical radiograph confirming single root and crown bifurcation of tooth 72.

DISCUSSION

Gemination is a rare dental anomaly characterised by the partial division of a single tooth germ during morphodifferentiation. This incomplete division results in a tooth with an enlarged or bifid crown, a single root, and a single root canal, giving the appearance of a double tooth. In the deciduous dentition, the prevalence of gemination varies geographically and demographically. Shilpa et al. reported a prevalence of 0.95% for "double teeth" (a term combining both gemination and fusion) among South Indian children aged 2-6 years, with a higher frequency observed in the mandibular anterior region [1]. Similarly, Mallineni et al. found that 2% of Arabian children exhibited double teeth in the deciduous dentition, with a slight predilection for girls and the mandibular arch [2]. Jain et al. studied 3000 Indian participants (ages 10-40 years) and reported a prevalence of gemination of 0.03% [5].

The etiology of gemination is multifactorial, including genetic, environmental, and mechanical factors. The characteristic bifid crown and single root canal are due to incomplete division of a single tooth during the morpho-differentiation stage of odontogenesis [3]. Genetic predisposition and racial factors appear to play a role, as evidenced by population-specific studies on the prevalence of dental anomalies [4].

Fusion is a dental anomaly that is characterised by the union of two adjacent tooth germs, resulting in the formation of a single, larger tooth. Unlike gemination, fusion has two separate roots and a large crown. Both gemination and fusion appear similar, so it is crucial to differentiate between them. The "two tooth rule," proposed by Mader, is beneficial for distinguishing between fusion and gemination [3,6]. In this rule, the number of teeth is an essential diagnostic factor. If the anomalous tooth is counted as one and the total number of teeth in the arch remains normal, it indicates gemination. This can be explained by the fact that a single tooth germ attempted to divide, resulting in two crowns, thus maintaining the correct tooth count. However, if counting the fused tooth as one results in a reduced number of teeth in the arch, it is indicative of fusion, as two tooth germs have merged, and one is missing from the count [3, 6].

Moreover, this is further complicated by the possibility of fusion between a normal tooth and a supernumerary tooth, or gemination occurring adjacent to a congenitally absent tooth, which can make clinical distinction ambiguous. Therefore, a combination of observing the crown morphology, counting the teeth, and analysing radiographs provides the definitive method to differentiate between these two anomalies.

Treatment considerations for gemination are highly dependent on the oral health and aesthetics. Early detection is crucial for effectively managing gemination, enabling the selection of an appropriate treatment plan and the implementation of regular follow-up appointments. Preventive care, such as fluoride application, is especially indicated when no immediate restorative treatment is necessary. For asymptomatic geminated teeth where aesthetics is the primary concern, composite or tooth reshaping are indicated. In cases of symptomatic deciduous teeth, the

recommended treatment may include pulpectomy followed by the placement of a crown, or the extraction of the affected tooth accompanied by appropriate space management [6-9]. In the present case, since the tooth was asymptomatic no treatment was indicated, except for preventive measures such as fluoride application and follow-up every 6 months.

CONCLUSION

Gemination is a rare dental anomaly that can affect esthetics and occlusion. A careful clinical and radiographic assessment is necessary to distinguish gemination from fusion. This case highlights the importance of accurate diagnosis and conservative treatment for asymptomatic teeth. Educating parents about oral hygiene and the potential implications of double teeth on the permanent dentition is a key.

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