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Case Report

Endodontic Treatment and Aesthetic Management of Gemination in Primary Central Incisor with Two Root Canals

Pranjal Sharma[1], **Sowndarya Gunasekaran**[2,*]

[1] *Specialist Pediatric Dentist, New Look Medical Center, Al Ain, Abu Dhabi*
[2] *Assistant Professor, Department of Paediatric and Preventive dentistry, Vinayaka Mission's Sankarachariyar Dental College, Vinayaka Mission's Research Foundation (Deemed to be University), NH 47 Sankari Main Road, Ariyanoor, Salem, 636308, India*

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* *Corresponding author.*
Sowndarya Gunasekaran
drsowndaryag@vmsdc.edu.in

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ABSTRACT

This case report discusses the endodontic treatment and aesthetic management of gemination in a primary central incisor with two root canals in a 3-year-old boy. Gemination is a dental anomaly characterized by the partial division of a single tooth bud, resulting in a tooth with an enlarged crown and, in some cases, two root canals. The prevalence of gemination is relatively low, particularly in primary dentition. The patient presented with a large upper left central incisor (#61) that exhibited deep decay and caries, along with radiographic evidence of pulp involvement and a bifid crown with two separate pulp chambers and root canals. A diagnosis of gemination was established based on the presence of a complete dentition. The treatment approach included pulpectomy of the geminated tooth followed by the restoration of the crown using direct composite filling. The procedure aimed to alleviate the patient's pain, preserve the primary double tooth, and maintain the space for the succeeding permanent tooth. The report emphasizes the importance of careful clinical and radiographic examination for accurate diagnosis and highlights the challenges associated with managing geminated teeth. It underscores the need for vigilant monitoring and maintenance to ensure the long-term oral health and aesthetics of such aberrant teeth.

Keywords: Gemination; Aesthetic Dentistry; Pediatric Dentistry

1 INTRODUCTION

Primary double teeth, which can manifest as either gemination or fusion, represent a significant and common developmental dental abnormality that can impact the oral health of children. These anomalies are associated with various clinical challenges, including periodontal issues, dental irregularities, misalignments of teeth, and the risk of dental decay in permanent dentition. Originally the title gemination was utilized for a tooth with a common root and root canal having a bifid crown, as a outcome of a solitary tooth bud splitting into two. There was a lot of controversy over this definition, as most of the investigators objected over a joining of two teeth in case of maxillary central incisor or joining of maxillary central incisor with a mesiodens to be counted as a single tooth as for then, the tooth number would be correct[(1)]. As far as current concepts are concerned, gemination is interpreted as a solitary augmented tooth or fused tooth in which the tooth tally is normal, considering the aberrant tooth is calculated as one. Prevalence is 0.5 percent in deciduous teeth and 0.1 percent in permanent dentition[(2)]. The aetiology is unknown, but trauma has been suggested as a possible cause, though a familial tendency has been suggested. Gemination is observed in the deciduous as well as in the permanent dentition[(3–5)]. In the anterior region, this anomaly can cause unpleasant aesthetic appearance due to irregular morphology. If a deep groove is present, these teeth may be susceptible to caries and periodontal disease and may require endodontic intervention in some cases which may be complicated[(6,7)].

2 CASE REPORT

A 3-year-old boy came to a private dental clinic, reporting pain and decay in his upper front teeth. The child had a full set of primary teeth. Upon examining his mouth, it was observed that the upper left central incisor (#61) had a significantly deep and decayed groove on both the front and back surfaces, along with extensive caries affecting the

facial, palatal, and incisal parts of the left upper central incisor. The radiographic examination showed dental caries involving enamel, dentin and pulp in relation to central incisor 61 and a radiolucent cleft was present between the two halves of anomalous tooth crown from crestal margin of the crown to the occlusal edge. The presence of two distinct pulp chambers and root canals was confirmed through examination, as depicted in Figure 1. To differentiate between gemination and fusion in the case of the upper left central incisor (61), the primary factor relied on the presence of a complete set of teeth.

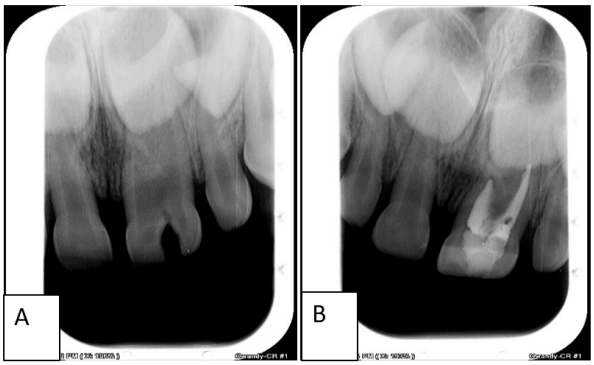

Fig. 1: (A) Pre and (B) postoperative intraoral periapical (IOPA) radiographs, showing primary double tooth with two pulp-chambers and respective root canals filled with root canal filling material

Taking into account the patient's history, along with clinical and radiographic assessments, a diagnosis of a double tooth impacting the primary upper left central incisor with chronic irreversible pulpitis was established. Procedure was designed following parental consultation, namely endodontic therapy for the aberrant tooth, succeeded by cosmetic restoration with direct composite filling.

After administration of local anaesthetics, direct access was gained to the root apices. Shaping and cleaning of the canals was performed using endodontic files, Irrigation of the root canals at every step was done with 2.5% sodium hypochlorite and normal saline. The root canals were filled using Metapex (Figure 1 B). Access cavity was sealed primarily with cavit and followed by glass ionomer cement; Aesthetic composite build up was done after colour matching. (Figure 2)

3 DISCUSSION

Though history of the prevalence of double teeth is vast, its nomenclature is debatable. Many interpreters have endeavoured to identify them by calculating the teeth or by discerning the root structure; others utilize gemination and fusion interchangeably. Interpretation based on the count of teeth present in the dental arch isn't always a practical

Fig. 2: Direct composite restoration done on primary maxillary central incisors

approach. This is because there can be instances where a "normal" tooth and a supernumerary one coexist without any hindrance, even when the neighbouring "normal" tooth is naturally absent, resembling known cases of gemination[8]. Utilizing Levitas' classification to identify amongst patients having gemination and fusion is a sound option. Also, certain academicians just label the occurrence "connated teeth" or "double teeth" to circumvent disparities about nomenclature[8]. Gemination was classified into four morphological types by Aguiló et al.[6] using both the clinical and radiographic appearance as criteria and guide(Table 1).

Gemination having more prevalence within deciduous dentition as opposed to permanent dentition confers an outcome on the adult dentition, namely late shedding of the involved teeth caused by enlarged root morphology and greater root surface area[6]. These variations showcase an issue of unsightly appearance caused by aberrant shape. There is a higher possibility for appearance of periodontal disease or caries, when deep grooves are present. In this particular case, extensive caries deeply affected the tooth, leading to chronic irreversible pulpitis. Consequently, the tooth underwent a pulp treatment and was filled with Metapex. The major periodontal issues in gemination patients are caused by the prevalence of grooves or fissures, in the merger of the concerned teeth. The risk of bacterial plaque agglomeration within the region is increased, especially if these aberrances run quite deep and grows subgingivally. For sustaining periodontal health, regular oral maintenance is mandatory. Furthermore, gemination may have an adverse effect on occlusion, causing deviation[9].

Meadors and Jones reported a case of primary double tooth involving primary maxillary right lateral incisor and a supernumerary tooth in a patient with cleft lip and

Table 1: Aguiló et al. classification of double teeth

Type	Criteria
Type I	A single bifid larger than normal crown with a notch on the incisal edge A bifid pulp chamber Ordinary morphology radicular canal and root having broadening in the cervical part
Type II	Large crown and a large root: A larger than normal crown commonly having a notch or groove, a solitary big pulp chamber A root usually bigger than conventional along its length and single large merged root canal
Type III	Two fused crowns with a double conical root
Type IV	Double roots, Fused crowns, two /more clearly discernible but combined roots having two individual canals

these teeth were surgically removed[10] Kamakura et al.[11] reported a case of the endodontically treated of fusion of supernumerary tooth to maxillary primary incisors.

In the present case, the treatment options were either pulpal therapy or surgical removal of the anomalous tooth followed by a space maintainer, to facilitate easy eruption of successional tooth. Pulpectomy, followed by the application of a composite restoration for the crown, was chosen as the preferred treatment method. This decision aligns with the approach advocated in several documented cases of primary double teeth in the literature, which have underscored the importance of preserving these primary double teeth[12–15].

4 CONCLUSION

For the operators to identify and manage geminated teeth, has consistently been tedious. Due recognition should be conferred to the disparity in root resorption, as exfoliation pattern are commonly dissimilar for individual tooth included in the gemination. Occlusal variations, aesthetic issues, and space issues could be conferred by geminated teeth. Therefore, for triumphant endodontic therapy and aesthetic rehabilitation of such aberrant tooth, cautious radiographic and clinical scrutiny is vital.

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