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Endodontic treatment and Aesthetic management of dental anomalies using direct composite.

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Abstract

The most common dental oddities seen in dental practice are fusion and gemination. It has always been an enigma for the dentists to differentiate between the two. Fusion is defined when the buds of two teeth fuse to make a large tooth. On the other hand, gemination symbolizes an incomplete attempt of a single tooth bud to split into two, by the virtue of which it exhibits two joined crowns and usually a single root. Its etiology involves several factors, i.e. genetic factors and environmental factors, etc. In a few cases, it is accompanied by supernumerary teeth, which ultimately results in further complexing the diagnosis. Both conditions give an aesthetically unpleasing appearance to the patient. Hence a better management strategy should be planned. The present case report shows the endodontic and esthetic management of the gemination teeth.

Keywords: Gemination, Fusion, Endodontic management.

Introduction

Gemination is a morphological dental anomaly that occurs when the single tooth bud attempts to divides at the time of development, to form two partially separated teeth. The peculiar tooth usually has totally or partially segregated two crowns. These crowns might have a single large pulp chamber or its pulp chamber could also be partially divided. There have been a few instances in literature, where complete division through the crown and root were seen. Most commonly primary dentition is affected when compared to the permanent dentition, especially in the incisor region (1). The frequency of gemination is quite variable and generally ranges from 0.1 to 1% (2).

The exact etiology of the double tooth is still idiopathic, but in literature, trauma has been observed as the most common cause followed by a hereditary tendency. Gemination occurs due to the invagination of the tooth germ at the time of tooth development which ultimately results in the deficient formation of two teeth. The structure thus formed appears as a tooth with two complete or partially complete crowns with a single root and commonly, a large root canal. Twinning is the formation of two analogous teeth by complete gemination/cleavage. The term fusion refers to the merging of two different tooth germs to form an apparently single tooth. Depending on the stage at which the tooth germs merge together, the fusion may be complete or incomplete (3).

The aim of this study was to discuss a case of successful endodontic and aesthetic management of gemination in the maxillary left lateral incisor.

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Case Report

A 13-year old male child was brought to the Department of Pedodontics and Preventive Dentistry, UCMS and GTB Hospital, New Delhi, with a chief complaint of a large tooth in the left upper front teeth region associated with pain and sensitivity [Figure 1]. Informed consent was taken from the guardian before performing the intraoral examination. On intraoral examination, it was observed that the affected tooth presented with an enlarged clinical crown. An intraoral periapical radiograph was taken and a large pulp chamber was observed with respect to the affected tooth 22 [Figure 2]. Pulp vitality test was also performed which gave a positive response. The patient complained of sensitivity to both hot and cold, discomfort on feeding and spontaneous pain during the night. There was no associated tooth mobility or pus discharge. On soft tissue examination, the gingiva was normal and other signs and symptoms of discomfort were not present. The medical history of the child did not reveal any significant finding. After a detailed examination and radiographic assessment, root canal treatment was decided upon as the treatment plan of choice. On access opening, a single pulp chamber with two distinct root canals merging in a common apical orifice was observed. Copious irrigation was done with 3% sodium hypochlorite during biomechanical preparation. A hermetic seal was achieved with proper obturation of the canal. The endodontic procedure was then followed by the composite build-up which alleviated the aesthetic concerns of the patient. A regular follow up was advised.

Discussion

The two most common anomalies of tooth development are fusion and gemination. It is identified by the presence of the wide clinical crown. The term fusion refers to the merging of two different tooth germs to form the apparently single teeth. This union may occur at the level at which the tooth germs join together, the fusion may be complete or incomplete. Clinically, the tooth with fusion appears with a large clinical crown and radiographically, its pulp chamber might be divided or may appear as a single large pulp chamber. It mostly presents with two distinct roots (4). However, our case presented with radiographic features of gemination i.e. the tooth had a single pulp chamber and partially divided canals in a single root. Endodontic treatment was performed followed by aesthetic restoration and reshaping of the large crown into the aesthetically pleasing crown. Endodontic management of teeth that have infrequent abnormality necessitates more attentiveness in diagnosing through radiographs and execution of root canal treatment due to the unique morphology of pulp chamber and pulp canal. This atypical morphology of tooth mostly results in various challenges during the accessing of pulp canal systems, determination of the working length and obturating large, partially divided root canal (5). Double teeth generally do not require any intervention as in most of the cases such teeth do not present with any symptoms. Nevertheless, typical problems related to this condition include unpleasing aesthetics, malocclusion, altered dental arch length, hypo/hyperdontia of the successional tooth, anomalies in the eruption of the permanent successor, dental caries or periodontal disease (6). To differentiate between gemination and fusion, it has been recommended that the fused/geminated crown counted as one while counting the number of teeth in the arch. If the number of teeth comes out to be one less than normal then it indicates fusion, and if count shows a full complement of teeth, then it indicates gemination (7). Some authors have suggested that gemination generally appears with a single root canal but contrary to that, it has been observed that

more than one distinct canal might be present in a few

of either enamel or dentin. Thus, depending upon the stage

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cases. Supernumerary teeth add further complexity in diagnosing and management of gemination and fusion. Syndromes namely Cleidocranial dysostosis, Gardner's syndrome, and Chondroectodermal dysplasia have been reported with the presence of supernumerary teeth (8). Our case presented the endodontic management of a large clinical crown diagnosed as gemination in a young, nonsyndromic boy achieving a successful esthetic and function rehabilitation for the same.

Conclusion

Endodontic procedure in teeth with abnormal morphology and complex root canal anatomy is a common clinical challenge. The aesthetic restoration of the palatal surface of the anterior teeth by the direct composite restoration technique requires the meticulous attention of the clinician. Thorough clinical and radiographic examination is of key importance for the successful endodontic management of such an anomalous tooth.

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Legends

1. Pre-Operative and Post-Operative Intraoral Picture



Before Treatment



After Treatment

2. Pre-Operative and Post-Operative IOPAR



Before Treatment



After Treatment