Gemination Involving Mandibular Third Molar - A Rare Case Report and Review of Literature

Amal Ahmed Khawaji¹, Maryam Mohammed Maashi², Nedaa Hasan Alhazmi³, Fareedi Mukram Ali⁴

^{1, 2, 3, 4} Department of Oral & Maxillofacial Surgery, College of Dentistry, Jazan University, Jazan (KSA), Saudi Arabia.

INTRODUCTION

Developmental anomalies affecting the teeth are because of disturbances in the formation of dental lamina and the germ of tooth. These can be due to inherited, congenital, idiopathic or acquired causes and can lead to anomalies of tooth number, shape, size or structure.^{1,2} If one tooth germ by division forms two equal teeth, the term gemination is used. It can be partial or complete (bifid crown). In complete division, two separate crowns with their own pulp chambers and one common root are formed.³ Enlarged tooth produced by incomplete division of a single bud of tooth is called as gemination. These developmental disturbances are not ordinary findings in regular dental practice. It is also called in literature by various terms such as "double formations", "fused teeth" or "joined teeth".⁴ Brook and winter to avoid terminology confusion called this incidence as "connated teeth" or "double teeth".⁵

Severity of gemination is based on the phase of formation of the tooth affected. The incidence of this type of developmental anomalies was reported to be less than 1 %.⁶⁻⁸ Appropriate diagnosis in early stages can prevent future problems and postsurgical complications, and can also facilitate the clinical management of such cases.⁹⁻¹¹ Here, a rare case study of gemination involving mandibular third molar is discussed.

PRESENTATION OF CASE

A 30-year-old male patient presented with a chief complaint of pain and swelling in the mandibular left posterior region since 1 to one and half month. The patient had no significant medical or dental history. Clinical examination showed pain in relation to permanent mandibular third molar on left side. The tooth had presence of deep occlusal caries. There was presence of slight swelling on buccal aspect in relation to this tooth.

Ortho-Pantomogram (OPG) showed a radio-opaque crown structure of tooth attached to the distal surface of vertically impacted mandibular third molar on left side. The tooth was showing presence of deep caries. Dentin and enamel structures can be seen in the distal attached crown structure. (Fig. 1)

Corresponding Author:

*Dr. Fareedi Mukram Ali,
Department of Oral & Maxillofacial
Surgery, College of Dentistry,
Jazan University, Jazan (KSA),
Saudi Arabia.
E-mail: faridi17@rediffmail.com*

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Figure 1. OPG of the Patient Showing Gemination of the Mandibular Third Molar of Left Side Showing Two Crowns and Three Roots

Based on the OPG findings, diagnosis of gemination of the mandibular third molar of left side was made. Also differential diagnosis of fusion of the supernumerary tooth or distomolar to the third molar was taken into the consideration.

As the tooth was symptomatic, it was extracted under local anaesthesia. The extracted tooth specimen consisted of two crown-like structures mesial and distal. The distal crown was attached to the mesial crown at an angulation. The distal crown had two cusps and they were of unequal size. The roots showed atypical morphology. (Fig. 2) Based on the clinical, radio graphical and extracted tooth specimen study, the tooth was determined to be gemination of mandibular third molar of left side.

Figure 2. Extracted Geminated Tooth Specimen Showing Two Separate Crowns and 3 Roots Morphology of Mandibular Third Molar

DIFFERENTIAL DIAGNOSIS

Gemination and fusion are often confusing and should be differentiated. Mader's rule of "Two Tooth" is useful for fusion and gemination differentiation. If an abnormal tooth is counted single and the teeth number in the arch is less, than fusion is measured. But, when the involving tooth is considered as one and the teeth number count in arch is normal, then considered as gemination or there is also possibility of fusion among supernumerary and normal teeth. Gemination is frequently seen in the maxilla, whereas fusion is commonly seen in the mandible.^{13,17}

DISCUSSION

According to previous studies, gemination occurs more commonly involving primary teeth (0.5 %) than the

permanent dentition (0.1 %). The gemination involving bilateral teeth can be present in 0.02 % in permanent and deciduous dentitions and more incidence seen in the Mongolians (5 %) than the Caucasians (0.5 %).^{2,12} The present case was involving permanent mandibular third molar.

Aetiology

The exact pathogenesis of gemination is unknown. Environmental factors like trauma, systemic diseases, vitamin deficiencies and genetic predilection were considered as possible causes.¹³ According to Grover & Lorton,¹⁴ the pathogenesis lies in the metabolic disturbances taking place during morpho-differentiation stage of the tooth germ. This condition can have a familial tendency. Gemination can be connected with syndromes like chondroectodermal dysplasia and achondrodysplasia.^{13,15,16}

Location

The most common site of occurrence is in maxillary primary incisors and canines.² In the present case, the mandibular third molar was presented with an anomalous crown structure and three rooted morphology. According to Guerisoli et al¹⁸ who analysed 114 cases of mandibular third molars, 0.9 % showed three root morphology while Sidow et al¹⁹ reported the same in 5 % of his cases.

Shape

Often the supernumerary teeth are somewhat unusual, or cone shaped and therefore fusion among normal and supernumeraries will demonstrate difference in the two halves of the connected crowns. But, in geminated teeth the two halves of the connected crowns are mirror images.^{20,21} In the present case the tooth showed atypical morphology.

Radiographs

Radiographs are commonly taken for the assessment of the level of abnormality.² CBCT gives a 3-dimensional picture of the complex anatomy, thus the clinician gets help to understand the root canal better, but its use should be judicious and weighed against risk-benefit considerations.^{22,23}

Clinical Considerations

Gemination when present in the anterior region is an aesthetic issue because of their abnormal morphology. Geminated teeth can be more prone for periodontal diseases, caries and spacing problems. The peculiar periodontal problem in these teeth happens because of the presence of grooves or fissures in the union between the involved teeth. If the grooves are deep extending to subgingival region, the plaque accumulation is quite high. Compulsory oral hygiene should be present to preserve health of periodontium. Restorations for deep grooves can decrease the possibility of caries. Also, gemination can influence interdigitation of teeth, alignment and arch symmetry resulting in crowding of teeth, delayed eruption and midline deviation.²³⁻²⁴ The present tooth showed presence of

deep occlusal caries which can be due to the complexity in oral hygiene maintenance because of presence of geminated tooth.

CONCLUSIONS

Dental practitioners must be well-versed with such morphological variations and should be able to diagnose and manage such anomalies as they may require some modification in the usual management protocol. So, a cautious observance of geminated teeth is suggested. A thorough case history, clinical and radiological assessment can give essential information necessary for the diagnosis. Clinicians should constantly think about the opportunity of conservative management.

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