

## Gemination: A Case Report

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### ABSTRACT

**Aim** The present case report discusses a conservative, esthetic management of a geminated central incisor and gives a brief overview of this morphological variation.

**Summary** The maxillary central and lateral incisors are a common site for morphoanatomical variances. If not diagnosed and treated properly these aberrations may lead to caries, loss of function, mal-alignment of teeth and loss of esthetics. Gemination is a malformation caused because of an attempt by a single tooth germ to divide, resulting in a large single tooth with a bifid crown, and a common root canal. It does not always affect the pulpal health and thus do not need an invasive treatment. Occasionally, only re-contouring or re-shaping of the abnormal morphology is required to improve the esthetics if the abnormal shape is not interfering with the occlusion or function of the patient.

**Keywords:** Gemination, fusion, twinning

### INTRODUCTION

The maxillary central and lateral incisors are a common site for morphoanatomical variances such as dens invaginatus, palatoradicular groove, gemination, concrescence and fusion.<sup>1</sup> If not diagnosed and treated properly these aberrations may lead to caries, loss of function, mal-alignment of teeth and loss of esthetics.<sup>2</sup> Out of these,



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Accepted for publication on : June 17, 2015

gemination and fusion often present with similar clinical picture, and are often discussed under a common heading of "double teeth". Gemination is a malformation caused because of an attempt by a single tooth germ to divide, resulting in a large single tooth with a bifid crown, and a common root canal, while fusion (synodontia) is a union between the dentin of two or more teeth which may be complete or partial and patient presents with a reduced number of teeth in the dental arch.<sup>3</sup> However, these anatomical anomalies do not always affect the pulpal health and thus do not need an invasive treatment. Sometimes only re-contouring or re-shaping of the abnormal morphology is required to improve the esthetics if the abnormal shape is not interfering with the occlusion or function of the patient.<sup>4</sup>

The present case report aims to discuss aesthetic management of an asymptomatic, but aesthetically compromised geminated central incisor with a conservative approach.

### CASE REPORT

A non-smoker, systemically healthy, male patient reported to the department of Conservative Dentistry with the chief complaint of a "hole" in his upper front tooth. There was no previous history of trauma. Clinical examination revealed a discontinuity in incisal edge and an absence of tooth structure on the labial aspect of the left maxillary central incisor (21)



**Figure1:** Pre-operative view of tooth 21 depicting increased mesio-distal width.

**To cite:** Bains R, Tikku AP, Chandra A, Verma P, Yadav RK, Bharti R. Gemination: A Case Report. Asian J Oral Health Allied Sci 2015; 5:15-17.



**Figure 2: Pre-operative palatal view depicting a “double tooth”**

giving an appearance of a “hole” in the tooth (Fig.1). The mesio-distal width of the tooth was also larger than normal. The appearance of the palatal surface was suggestive of two incisors joined together from the cemento enamel junction upwards (Fig. 2). Intraoral periapical radiograph (IOPA) of the tooth showed an enlarged pulp canal space with a single root canal but bifurcated into two distinct pulp chambers coronally (Fig. 3). There was no periapical radiolucency or change in the radiographic appearance of the lamina dura. The number of teeth in the arch was normal. The clinical and radiological appearance and a normal number of teeth in dental arch were suggestive of a geminated left maxillary



**Figure 3: IOPA radiograph showing a bifid pulp chamber and single root canal.**



**Figure 4: Post-operative view.**

central incisor. The tooth responded within normal range to both thermal and electric stimuli, as well as to clinical percussion and palpation tests. As the patient had no complaints other than aesthetic concerns, a composite resin build-up of the tooth was planned.

After shade matching and rubber dam application, the discoloured margin of the defect were beveled with a fine grit diamond bur. A non-rinse, self-etch one-step bonding agent (Xeno V, Dentsply DeTrey, Germany) was applied over the margins and light cured for 20 seconds. The defect was then built-up with a nano-composite resin (Ceram-X-Mono, Dentsply, DeTry, Germany) and cured for 20 seconds. Finally, the restoration was finished and polished using composite finishing stones and polishing discs (Fig. 4).

## DISCUSSION

Union between two teeth can occur at the level of cementum, dentin or enamel. The double teeth (i.e. gemination and fusion) occur with a slightly greater prevalence in the primary dentition (0.6-2.8%) than the permanent dentition (0.1-1%). Asian populations have a higher predilection of about 5% and the incisors and canines are the teeth most commonly affected<sup>5</sup>.

Differential diagnosis is often challenging in these cases and depends on the number of teeth in the arch, clinical features and radiographic findings. While the cases with fusion of teeth present with one tooth less than the normal in dentition, gemination presents with a normal number of teeth in the arch. However, this rule doesn't work when a supernumerary tooth is fused to tooth in the arch (referred to as diphodontic germination).<sup>6</sup> Radiographs provide critical information for diagnosing these cases. Radiographically, a geminated tooth will be seen as having a large, single canal

and two distinct pulp chambers, while fused teeth present with two separate root canals.<sup>1</sup> Cone beam computed tomography (CBCT) gives a three dimensional perspective of the complex anatomy, thus helping the clinician to comprehend the canal better, but its use should be judicious and weighed against risk-benefit considerations.<sup>7</sup> Surgical loupes and operating microscopes are a useful adjunct during diagnosis and management of such cases. In the present case a bifid pulp chamber, a single canal and normal number of teeth in the arch supported the diagnosis of gemination. Also, radiographic examination revealed a single root canal which bifurcated at the level of pulp chamber. There were no radiographic changes seen in the periodontal ligament space or the periapical area. Generally, these situations do not require any intervention and treatment depends on patient's needs.<sup>8</sup> As the tooth in question was asymptomatic and without any signs of pulpal afflictions, so selective re-contouring and reshaping along with restoring the coronal notch was performed for esthetic rehabilitation. Sometimes, attempts have been made to cut the coronal chamber into two to give them a normal appearance.<sup>9</sup>

However, if endodontic treatment is required in a pulpally involved tooth, access opening, cleaning-shaping and obturation may require some modifications. Access opening should be conservative and modification in shape depends on the deviation from normal anatomy. Use of sonic agitation devices such as Endoactivator or Passive Ultrasonic Irrigation with sodium hypochlorite helps in better debridement of the pulpal space<sup>10</sup>. Lateral condensation method of obturation may not suffice to completely seal the deviated anatomy. Thus, obturation in such cases should be performed with a flowable, thermoplasticized gutta-percha to achieve a three-dimensional seal of the intricate anatomy.<sup>11</sup> In an interesting case report, Bains *et al.*<sup>12</sup> used cold-injectable gutta-percha (Gutta-flow) as back-fill along with an apical gutta-percha plug to obturate a geminated incisor.

## CONCLUSION

The clinicians should be familiar with such morphological variations and be well-equipped to diagnose and manage such anomalies as they may require some modification in

the normal treatment procedures or need some additional diagnostic and clinical aids for the long term survival of such teeth.

**Conflict of interest:** No conflict of interest declared by authors.

**Source of funding:** Nil

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