

## Bilateral gemination in mandibular lateral incisor – a rare case report

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### Abstract

Double teeth are developmental anomaly which occurs as a sequel of fusion of two teeth or as a sequel of division of single tooth bud during tooth formation. Gemination is seen more commonly in deciduous teeth and may be present in permanent dentition. This article presents a rare case report of bilateral gemination of 32 and 42 in 22 year old female patient. Intraoral radiograph showed fused crown, pulp chamber and single canal for 42 and fused pulp chamber with separate roots for 32. Double tooth diagnosis, differential diagnosis and its classification with treatment has been discussed. Gemination is similar in appearance to fusion and this article highlights their difference in clinical and radiographic appearance.

**Keywords:** Gemination, Fusion, Developmental anomaly, Double tooth.

### Introduction

Gemination is a developmental anomaly of anatomy of teeth which commonly affects deciduous teeth and may also occur in permanent dentition. Maxillary incisor is the most commonly seen site for it. The gemination is considered when incomplete division of tooth from one single germ occurs or, if there is fusion of a normal and supernumerary tooth.<sup>[1]</sup> This article presents a rare case of asymptomatic bilateral mandibular double teeth of permanent dentition in mandibular lateral incisors.

In Gemination the tooth count is normal when the abnormal tooth is calculated as one. Fusion is the combining of two tooth germs to make a large tooth. In

fusion the tooth count is one less, when the anomalous tooth is considered as one. It is found commonly in the lower jaw, with equal sex predilection. The terminology “double tooth,” “double formations,” “joined teeth,” or “fused teeth” are frequently used for gemination and fusion. Prevalance rate of one-sided gemination is 0.5% in deciduous and 0.1% in permanent dentition. Bilateral cases are seen in 0.01% to 0.04% of deciduous teeth and in 0.02% to 0.05% in permanent dentition.<sup>[2]</sup>

Clinical diagnosis of fusion, macrodontia and gemination may be difficult when these anomalies occur with hypodontia or supernumerary tooth and following points can be considered for diagnosis (Table 1).<sup>[2,3]</sup>

**Table 1**

| Gemination   | Fusion  | Macrodontia                                      |
|--|---|--|
| Mirror images of coronal halves with central groove. | Occurs at an angle resulting in crooked appearance. | Tooth involved is larger with normal morphology. |
| Usually Single big root and root canal.              | Separate pulp chamber and root canal.               | Single root.                                     |
| Two crowns either totally or partially separated.    | Crown is united by enamel and dentin.               | Enlarged normal crown.                           |
| Usually with a single root and one root canal.       | Two roots or two canals in a single root.           | Enlarged normal root and pulp.                   |
| Causes crowding.                                     | Causes ectopic eruption.                            |  |

### Case Report

A 22 year old female patient came for routine dental check-up. On examination bilaterally asymptomatic enlarged 32 and 42 were observed in lateral incisor region with groove present labially and lingually. The central groove divided the teeth into double joined tooth or mirror image crown with crowding of mandibular teeth. The number of teeth present in dentition was normal and double tooth was given as provisional diagnosis, considering the joined tooth as single tooth. (Fig. 1) Gemination and fusion were considered for differential diagnosis. The following measurements were recorded clinically.

**Table 2**

| Measurements                | Double tooth (mm)      | Normal tooth (mm) [4] |
|-----------------------------|------------------------|-----------------------|
| Mesiodistal Diameter of 32  | 12                     | 5.5                   |
| Buccolingual width of 32    | 6.5                    | 6.5                   |
| Cervicoincisal Length of 32 | 10                     | 9.5                   |
| Mesiodistal diameter of 42  | 9                      | 5.5                   |
| Buccolingual width of 42    | 6.5                    | 6.5                   |
| Cervicoincisal Length of 42 | 9                      | 9.5                   |
| Central groove              | Present Buccolingually | Absent                |

IOPAR of the 32 showed joined crown and pulp chamber with separate roots. (Fig. 2 & 3) IOPAR of 42 showed crown with single pulp chamber and single root. The diagnosis of gemination for mandibular lateral incisors was given, as 42 showed single pulp canal and root with clinically joined crown and crown of 32 showed joined pulp chamber with separate roots. Fusion with supernumerary tooth was ruled out for 42 because the joined teeth were presenting mirror image and joined pulp existed coronally and macrodontia was ruled out because of presence of central groove.



**Fig. 1: Arrowhead showing (32 & 42) bilateral mandibular double teeth with central groove**



**Fig. 2: Showing double tooth of 32 with joined crown & pulp chamber with separate root**



**Fig. 3: Showing single wide crown and root with single canal for 42 double tooth**

### Discussion

Brook & Winter (1970) suggested an impartial term for these anomalies, such as "double teeth".<sup>[1]</sup> The etiology of gemination is unspecific and heredity, trauma to the developing tooth bud, evolution, and environmental factors are proposed to play a role in its occurrence. This anomaly may occur with syndromes such as chondroectodermal dysplasia and achondrodysplasia. It is perceived that gemination is caused by a synergistic effect between genetic and environmental factors.<sup>[2]</sup>

These anomalies may develop as a consequence of a developmental variation of the ectoderm and mesoderm of tooth bud. The stage of formation of the involved tooth is responsible for severity of anomaly and may also occur with other tooth anomalies like mesiodens, talons cusp, and dens invaginatus. Gemination is more prevalent in the anterior maxillary region. Although, it can be seen in posterior teeth.

With respect to its appearance in different races, it is commonly seen in the Mongolian race (5%) than in the Caucasian (0.5%). Moody & Montgomery reported, gemination of deciduous teeth only in females for four generations, suggesting towards its hereditary role in etiology.<sup>[3]</sup>

## Classification of double teeth

Table 3<sup>[5,6]</sup>

| Type of Double tooth | Tooth Anomaly   | Number of teeth in arch considering anomalous tooth as one |
|----------------------|---|--|
| Gemination           | Cleavage of a single tooth germ <ul style="list-style-type: none"> <li>▪ Partial cleavage- True gemination.</li> <li>▪ Complete cleavage – Twinning.</li> </ul>   | Normal   |
| Fusion               | Two separate tooth germs fused during Formative stage <ul style="list-style-type: none"> <li>▪ True fusion- Union by enamel and dentin.</li> <li>▪ Late fusion- Union by dentin or cementum.</li> </ul> | Hypodontia   |
| Concrescence         | Attached by cementum.   |  |

Mader's "two tooth" rule may be considered for discriminating fusion and gemination. If fused teeth are counted as one and the total teeth number of dentition (without extraction or missing) is less than fusion is considered. However, when the double tooth is calculated as one and the total teeth number in dental arch is normal then it is diagnosed as gemination or is a presentation of fusion between normal and supernumerary teeth.<sup>[7]</sup>

A double tooth was classified into four morphological types by Aguilo et al, based on clinical and radiographic appearance.

Type I has a single bifid crown, a larger than normal crown with an incisal edge notch, a bifid pulp chamber, normal sized root and pulp canal with widening in the cervical region.

Type II has a large size of crown and root: a larger than normal crown mostly with a groove or notch, a single large pulp chamber, a large root than normal along its length and one large shared root canal.

Type III has two fused crowns with double conical root.

Type IV has fused crowns, double roots, two or more roots clearly distinct but joined with two separate canals.<sup>[8]</sup>

Geminated teeth may require multidisciplinary care for aesthetic and functional problems. Careful clinical and radiographic examination of affected tooth is essential to decide the treatment of the coronal and root halves involved.<sup>[9]</sup> The buccal and lingual deep grooves may favor plaque accumulation leading to dental caries and periodontal diseases. The complex tooth morphology, pulpal anatomy, and tooth position may cause difficulty in rubber dam placement for endodontic treatment and necessitate surgical removal of the affected tooth. Asymptomatic anterior double tooth should be left alone unless problems arise with esthetics, spacing, and dental caries. Composite restorations in the fissures can be done for esthetics and preventing caries.<sup>[5]</sup> Coordination between endodontic and surgical treatment may maintain one half of tooth. Orthograde endodontic treatment, hemisection and

orthodontics may be done for aesthetic problem of a geminated tooth.<sup>[9]</sup>

Early diagnosis of the gemination or fusion has a considerable importance. It should be followed by careful clinical and radiographic observations if required.

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