

# Gemination of a Permanent Lateral Incisor- A Case Report with Special Emphasis on Management

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## ABSTRACT

The purpose of this case report is to describe the successful endodontic treatment and surgical management of a unesthetic geminated permanent maxillary lateral incisor tooth. Geminated maxillary incisor clinically revealed bifid crown with coronal groove and intraoral periapical radiograph showing radiolucent lesion with sclerotic border. orthograde root canal treatment was performed. surgery was done by reflecting limited thickness mucoperiosteal flap, cyst enucleated, root end resected and retrograde filling done using mineral trioxide aggregate. During the follow up examination, post operative intra oral periapical radiographs revealed healing of periapical lesion.

**Key words:** Gemination, Periapical Cyst, Retrograde Filling.

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## Introduction

Gemination is an attempt of tooth bud to divide, this partial division is arrested before tooth development is completed, the end result is single



**Fig. 1:** Clinical photograph of the geminated lateral incisor

tooth with a bifid crown and the total number of teeth is normal<sup>1</sup>. The aetiology of fusion and gemination remains unclear. There are several hypotheses. Grover & Lorton claim that local metabolic interferences, which occur during morphodifferentiation of the tooth germ, may be the cause. They suggest that there could be a relationship amongst gemination, twinning and odontoma<sup>2</sup>; another possibility is trauma<sup>3</sup>. Gemination and fusions are generally asymptomatic. However, there could be poor aesthetics, periodontal destruction or caries leading to pulp necrosis<sup>2</sup>. Unusual crown size may be aesthetically disturbing, especially if anterior teeth are involved<sup>4</sup>. Gemination of



**Fig. 2:** Clinical photograph showing palatal swelling.

permanent teeth may require treatment for aesthetic, orthodontic and functional reasons.

### Case report

A 23 year old male patient presented with complaint of pain and swelling in relation to permanent maxillary left lateral incisor since 2 months. Patient gave history of pain since 3 years and pain had become severe since two months. The pain was throbbing in nature and exacerbated with appearance of swelling on the palatal aspect. Patient gave no history of trauma, analgesics relieved the pain.

Intra oral examination revealed palatal swelling of 1x1 cm, noticed in the left anterior palatal region extending from lateral incisor to canine(Fig 2). The swelling was soft in consistency and tender on palpation.

On clinical examination, the total number of teeth in arch was normal, maxillary left lateral incisor showed gemination with bifid crown and presence of coronal groove(Fig 2). No caries were detected. The tooth gave no response to vitality tests. Mobility test showed grade 1 mobility and the tooth was tender on percussion.

Periapical radiograph confirmed the incomplete cleavage of the lateral incisor with single pulp chamber. Incomplete closure of the root apex and radiolucent lesion of 1 cm diameter having sclerotic borders was noted.(Fig 3)

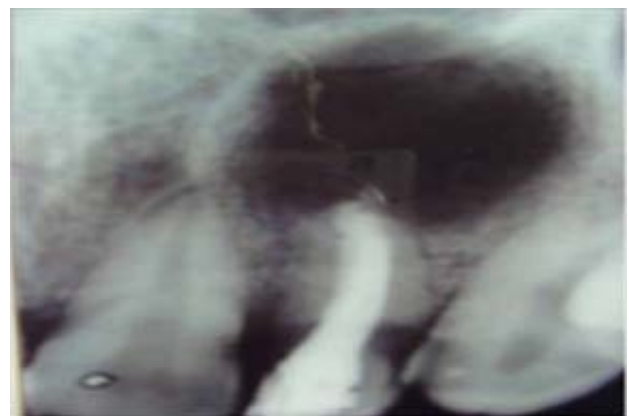
### Management

Orthograde root canal therapy was performed for permanent maxillary left lateral incisor.(Fig 4).On recall visit after one week, patient had pain, periapical surgery was planned. Routine blood investigations were performed and informed consent was obtained from the patient.

Prior to administrating local anesthesia, the patient rinsed for 1 minute with 0.12% chlorhexidine mouth rinse. Limited thickness mucoperiosteal flap was reflected after obtaining



**Fig. 3:** Preoperative radiograph showing periapical radiolucent lesion and incomplete closure of root apex.



**Fig. 4:** Orthograde root canal treatment of geminated maxillary lateral incisor

adequate anesthesia by block infiltration(Fig 5). Window preparation was done with surgical round bur,(Fig 6) cyst enucleated, root end preparation with retrograde filling done with mineral trioxide aggregate(Fig 7). Prior to the closure of flap, hydroxyapatite bone graft and



**Fig. 5:** Submarginal scalloped rectangular flap was reflected

platelet-rich plasma were placed on the defect. IOPAR was taken and mucoperiosteal flap repositioned, and interrupted suturing done with no 4.0 mersilk(Fig 8). Patient was discharged with post-operative instructions under coverage of antibiotics and analgesics.

On subsequent examination, no signs or symptoms of dental infection was noted. Post-operative intra oral periapical radiograph revealed healing of periapical lesion.(Fig 9).

### Discussion

Morpho-anatomic changes in teeth may be divided accordingly to the site of occurrence i.e. tooth crown, roots, root canals. Gemination and fusion are developmental anomalies with inherently unusual and bizarre anatomy. Clinically it may be difficult, if not impossible to differentiate fusion from germination when supernumerary teeth are involved. Gemination and fusion are anomalies with close similarity, inherited by different aetiology. These anomalies may develop during tooth bud morphodifferentiation as a result of developmental aberration of both the ectoderm and mesoderm<sup>2</sup>. The sites of predilection are the incisor- canine regions with apparent equal distribution between the two jaws and are more

common in deciduous teeth. They are very rare in molars<sup>1,5</sup>.

Traditional terminology such as concrescence, fusion, and gemination should be used as potential embryologic cause of the anomaly and not as an exact diagnosis<sup>6</sup>. To help to distinguish between fusion and gemination, it has been suggested that the teeth in the arch be counted with the anomalous crown counted as one. A full complement of teeth indicates gemination, whilst one tooth less than normal indicates fusion<sup>7,8</sup>. This rule is compromised if a normal tooth fuses with a supernumerary tooth<sup>9,10,11</sup>.

Case history, clinical examination, and radiographic examination can provide the



**Fig. 6:** Window preparation done with surgical round bur

information required for the diagnosis of such abnormalities. Teeth with this defect are unesthetic due their irregular morphology, they



**Fig. 7:** Root end resection, retrofilling done with MTA



also present high predisposition to caries, periodontal disease and spacing problems.



**Fig. 8:** Flap approximation and suturing done

Grooves present on the tooth surface may act as an ideal plaque trap and provide a niche for the



**Fig. 9:** Follow up radiograph showing healing of the periapical lesion after 6 months

growth of bacteria. The pulp is also affected by bacteria which are situated in these groove, routes of bacterial invasion into the pulp may be via the exposed dentinal tubules on the side of groove.

After judicious evaluation of all information, and histological findings confirmed that, this case can be reported as a case of gemination with infected periapical cyst. The best way to treat this case was to perform endodontic treatment and surgical procedure for enucleation of the periapical cyst, root end resection and retro filling with mineral trioxide aggregate followed by restoration of tooth crown for esthetic purpose. Mineral trioxide aggregate was used because of its biocompatible

surface for the adhesion or attachment of bone and cementum and hydroxyapatite was used in this case as graft to promote regeneration. Platelet rich plasma was used as valuable adjunct in wound healing, initiate the regeneration of hard and soft tissues.

### Conclusion

Strict adherence to biomechanical principles of root canal preparation usually produces predictable successful treatment of teeth with an unusual anatomy. However, with extensive periapical lesions which do not respond to orthograde treatment, surgical approach can be used. The placement of osteoconductive material and platelet rich plasma can aid in resolution of the periapical lesion.

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