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

Sharada H L1, Bharathi Deo2, Biji Briget3

1Reader, Department of Conservative Dentistry and Endodontics, Mansarovar Dental College Hospital and Research Institute, Bhopal, Madhya Pradesh, India; 2Professor & Head, Government Dental College and Research Institute, Bellary, Karnataka, India; 3Senior Lecturer, Department of Conservative Dentistry and Endodontics, Government Dental College and Research Institute, Bangalore, Karnataka, India.

ABSTRACT
The purpose of this case report is to describe the successful endodontic treatment and surgical management of a unesthetic gminated 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.


Source of Support: Nil
Conflict of Interest: None Declared
Received: 23rd December 2012
Reviewed: 19th January 2013
Accepted: 12th February 2013

Address for Correspondence: Dr. Sharada H L. Reader, Department of Conservative Dentistry and Endodontics, Mansarovar Dental College Hospital and Research Institute, Bhopal - 462042, Madhya Pradesh, India. Contact No. +91 – 9663503658. Email: drsharadahl@gmail.com.

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 tooth with a bifid crown and the total number of teeth is normal1. 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 odontoma2; another possibility is trauma3. Gemination and fusions are generally asymptomatic. However, there could be poor aesthetics, periodontal destruction or caries leading to pulp necrosis4. Unusual crown size may be aesthetically disturbing, especially if anterior teeth are involved5. Gemination of
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% chrohexidine mouth rinse. Limited thickness mucoperiosteal flap was reflected after obtaining 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 mesoderm². 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 molars¹,⁵.

Traditional terminology such as concrescence, fusion, and gemination should be used as potential embryologic cause of the anomaly and not as an exact diagnosis⁶. 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 fusion⁷,⁸. This rule is compromised if a normal tooth fuses with a supernumerary tooth⁹,¹⁰,¹¹.

Case history, clinical examination, and radiographic examination can provide the information required for the diagnosis of such abnormalities. Teeth with this defect are unesthetic due their irregular morphology, they
also present high predisposition to caries, periodontal disease and spacing problems.

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

**References**

of a case. Endodontics and Dental Traumatology 8, 130–3.