

Treatment Plan and Clinical Management of a Geminated Maxillary Lateral Incisor: A Case Report

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Abstract

The anatomic anomalies detection is important for an attentive clinician. A successful treatment of an endodontically involved tooth should make it functional and aesthetically acceptable for the patient. The following article presented a case of gemination and the endodontic, prosthetic and periodontal treatments which were done to keep a complicated tooth in aesthetic zone.

Key words: Clinical management, germination, maxillary lateral incisor.

Introduction

Developmental alterations in tooth shapes especially in esthetic zone, is a great challenge. Three definitions which are currently used are gemiantion, fusion, and concrescence.

Gemination: A single enlarged tooth or joined (double) tooth in which the tooth count is normal when the abnormal tooth is count as one.

Fusion: A single enlarged tooth or joined (double) tooth in which the tooth count reveals a missing tooth when the anomalous tooth is count as one.

Concrescence: Union of two adjacent teeth by cementum (with the involvement of dentin).

Gemination is more frequent in anterior region of maxilla whereas fusion is more common in mandible. gemination happens in both primary (0.5%) and permanent dentition (0.1%) which tend more to happen in deciduous teeth (1,2). It happens when a single tooth bud attempts to divide to two teeth, which leads to form a bifid crown and usually a common root canal, but in the fusion two separate tooth buds are joined by dentin. In very rare cases other anomalies like talon cusps could be added to these anomalies (3).

These macrodontia caused by germination or fusion can cause different problems such caries, aesthetics, periodontal problems, prosthetics that could be challenging in treatment plan and performance (4). The following article presented a case of gemination and the endodontic, prosthetic and periodontal treatments which were done to keep a complicated tooth in aesthetic zone.

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Case Report

The patient was a 27 year old female who came to our clinic with chief complaint of aesthetic in anterior region of maxilla after the fracture of her left lateral incisor crown (Fig. 1). In clinical examination it was obvious that the space of the missing crown was more than the space of the other lateral incisor. Diagnostic radiograph showed a macro tooth with two canals that were joined in apical area (Fig. 2). Since the dentition count was correct, the diagnosis was a geminated lateral incisor which most of its crown structure was destroyed by caries. A groove was observed in the middle of the facial surface which could be probed 4mm.



Figure 1. Geminated lateral incisor



Figure 2. Pretreatment radiograph

After the consultation with periodontist and prosthodontist the treatment plan was made. Treatment plan included root canal therapy (RCT), crown lengthening, post and core foundation and crown, an aesthetic filling on the adjacent canine to reduce the space caused by different size of the geminated tooth comparing to the other normal lateral incisor.

In the first step of the treatment, RCT started. Working length determination was done with a #15 K-files (Dentsply, Maillefer, Switzerland). Working length from the most coronal point of the crown was 24 mm. The final shape was achieved by F2 ProTaper system (Dentsply, Maillefer, Switzerland). Caution was made to not invade the dental wall dividing two canals by brushing the instrument to the outer wall of the canal. Sodium Hypo chlorite was chosen as the irrigator. The

smear layer was removed with 17% EDTA activated by Endo Activator before obturation. Obturation was done by gutta-percha (Meta, South Korea) and cold lateral condensation technique with AH26 sealer (Fig. 3).



Figure 3. Obturation

In the second step, the crown lengthening procedure was done before making the restoration. The periodontal pocket in depth of the buccal groove was removed and gingiva was formed. Periodontal surgery prepared a ferrule effect about 2 mm for the restoration (Fig. 4).



Figure 4. After Crown lengthening

In the third step, one month after periodontal surgery metal casting posts were fabricated. Post rooms were prepared first by touch and heat system and enlarged with peezo-reamer (Mani, Japan) size 2 and 3. Depth of the post room was 12mm in both canals. For each canal a direct post was formed by duralay (Reliance, Illinois, USA). Metal posts were cemented with glass ionomer (Fuji, Tokyo, Japan).

The size of the crown was reduced as possible as it could to give a more natural view comparing to the opposite normal lateral incisor. A temporary crown was made and the permanent crown was prepared from zirconium with CAD-CAM technique to have the most beautiful and natural color and texture with least thickness (Figs. 5 and 6).



Figure 5. Double post



Figure 6. Fabricated posts

After cementation of the crown the space between cuspid and lateral incisor was restored with composite to give an acceptable smile both for the patient and the dentist (Figs. 7 and 8).



Figure 7. After crown cementation



Figure 8. Frontal view after treatment

Discussion

The presented case was macrodontia of left lateral maxillary incisor. The term gemination is used when the teeth count is correct but if the tooth count is one less than normal it is called fusion which is the joining of two separate tooth buds. Sometimes in very rare cases the tooth bud joins to a supernumerary tooth in these cases the teeth count does not change but it is not germination, the exact diagnosis is referred to histological changes during development of the tooth. Clinically the term double tooth is sometimes used without assuming the histological origin of the situation, maybe it is not exact but it's useful. The important point in these situations is the management of the complement problems (1,5).

In our case the lateral incisor had two canals which were positioned mesially and distally. The canals were common in apical few millimeters. During endodontic treatment of a double tooth, the clinician must be prepared for abnormal root canal anatomy and irregular outline of the access cavity. Sometime a multidisciplinary approach to treatment and restoration the function and aesthetic appearance is required. Successful endodontic treatment depends on careful cleaning, shaping and three-dimensional obturation of the root canal system (6,7).

Conclusion

An expert clinician should be aware of rare anatomical variations which may complicate the treatment plan and the performance of the plan. A multidisciplinary approach is sometimes needed to get an acceptable treatment. Gemination is one of developmental anomalies which mostly happen in maxillary anterior region.

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