



CASE STUDY

MANAGEMENT OF DOUBLE TEETH IN UPPER ANTERIOR REGION WITH EIGHTEEN MONTHS FOLLOWUP

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ABSTRACT

For successful root canal therapy a thorough knowledge of the internal as well as the external dental anatomy is required. Variations in morphology can be seen in any tooth, even maxillary lateral incisor. This case report describes a multidisciplinary approach involving endodontic and prosthetic considerations for a good esthetic and functional rehabilitation of the maxillary lateral incisor fused with a supernumerary tooth. The clinician should have an accurate knowledge about the anatomy of each tooth, to identify the presence of unusual numbers of roots and their morphology. Careful interpretation of the radiograph and clinical visualization of the floor of the chamber and proper modification of access opening are essential for a successful treatment outcome.

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INTRODUCTION

One of the main goals of nonsurgical root canal treatments is the elimination of infection and prevention of reinfection of the root canal system (Sponchiado *et al.*, 2006). A poor knowledge about the morphology of root canal systems is the cause of a significant number of problems occurring during root canal treatment due to the fact that an aberrant morphology can be found in any tooth, even in a maxillary incisors. Teeth may be maldeveloped in shape, size, and structure during developmental stages. Morphological and anatomic changes in teeth may be divided on the basis of the site of their occurrence, ie, tooth crown, roots, and root canals. For instance, some irregularities concerning the number and shape of teeth are named as 'fusion', 'gemination', 'conrescence', 'talon cusp' or 'dens evaginatus'. Pindborg (Rani *et al.*, 2010) defined fusion as the union between dentin and/or enamel of two or more separate developing teeth. Fusion, an uncommon anomaly of the hard dental tissues, may cause clinical problems like spacing, and periodontal breakdown.

The incidence of fusion is found to be <1% for the white population. Clinically, it is often difficult to differentiate between gemination and fusion, and hence these anomalies are sometimes called as "double teeth". Clearly, a careful clinical and radiographic examination is beneficial for optimal diagnostic tool in endodontics for assessing the root canal configuration. However, periapical dental Xrays are not enough to aid in understanding the complicated morphology of the root canal system especially in fused teeth. These problems might be overcome by using newer diagnostic methods such as cone beam computed tomography, spiral computed tomography (SCT) or volume acquisition CT, which can produce 3-dimensional (3D) images of individual teeth and the surrounding tissues (Iury Oliveira Castro *et al.*, 2014). This case report presents the endodontic and esthetic management of a fused maxillary lateral incisor with a supernumerary tooth.

Case report

A 22-year-old male patient presented to the Department of Conservative Dentistry and Endodontics with chief complaint of fractured tooth and sensitivity to hot and cold food in the right maxillary anterior region. On clinical examination, the maxillary right lateral incisor exhibited abnormal crown

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morphology with ellies class III fracture. An angled radiograph revealed a fused lateral incisor (12) with fracture involving the pulp chamber on distal side (Fig.1). Normal Periodontal ligament space was seen. After conducting all relevant clinical, radiographic and vitality tests, a diagnosis of chronic irreversible pulpitis of the right maxillary lateral incisor with fusion of supernumerary teeth was made. Treatment plan consisted of endodontic therapy followed by suitable extracoronal restoration. Upon securing anaesthesia and adequate endodontic access with high-speed airtor handpiece, a sharp endodontic explorer was used to locate the canal orifices. After Coronal flaring, the working length was determined by using apex locator (root zx mini) and confirmed radiographically. Cleaning and shaping of the root canal system were completed by using a crown down technique (apical enlargement was done up to ISO no.40) using 2% stainless steel K file (Dentsply, Germany).

Canals were copiously irrigated with sodium hypochlorite (5.25%) and 15% EDTA and followed by saline. Master cone radiograph was taken to ascertain proper fit of the gutta percha (Fig. 2). The canal was then obturated with conventional cold lateral compaction gutta-percha technique and AH Plus sealer (Dentsply, Germany) and confirmed radiographically (Fig.3). After the endodontic treatment was finished, the esthetic treatment was discussed with the patient. Fibre post was cemented followed by core build up with composite (Fig.4). The fused tooth was prepared to receive porcelain fused to metal crown (PFM) and was cemented (Fig.5). Follow up radiograph after 18 months shows no periapical inflammation and complete healing was observed (Fig.6).



Fig. 1. Pre-operative radiograph



Fig. 2. Master cone radiograph



Fig. 3. Obturation radiograph

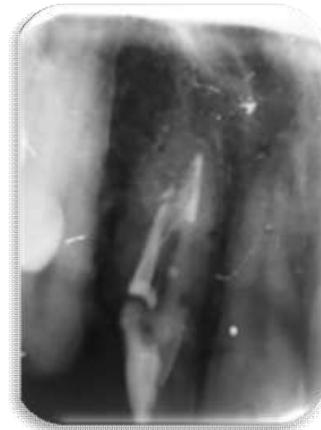


Fig. 4. Post placement radiograph



Fig. 5. PFM crown cementation



Fig. 6. 18 months follow up radiograph

DISCUSSION

An abnormal tooth form is a challenge to the dental practitioner. Fused teeth afford a striking clinical manifestation of the differentiable and morphogenetic processes of tooth development. Fusion between supernumerary and permanent teeth occurs is rare than fusion between other types of teeth. The incidence of a unilateral occurrence is estimated to be 0.5% for deciduous and 0.1% for permanent dentition. The incidence of bilateral occurrence is estimated at around 0.02% for both types of dentition (Tomizawa *et al.*, 2002). According to Nadal-Valldaura and others, fusion is described as a union of two adjacent dental germs that correspond to normal pieces and which continue together in development, erupting as a fused tooth. Although the aetiology is not clear, environmental factors, trauma, vitamin deficiencies, systemic and genetic diseases are described as the possible causes (Kremeier *et al.*, 2007). Usually, there is a presence of furrow that can vary in depth, and may or may not be present throughout the crown and root, indicating the line of adhesion between both tooth germs (Flares Baratto-Filho *et al.*, 2012). Radiographs help in delimiting the layers which are involved in fusion/gemination and to check whether the fusion is total or coronary. To explain fusion, some authors suggest a lack of space as the cause of deep penetration of the dental follicles. Generally, fused teeth are asymptomatic and do not require treatment, and if esthetically acceptable, one can retain the anomalous tooth (Hashim *et al.*, 2004) However, double teeth may be responsible for esthetic and functional problems, caries in the grooves, particularly in the fusion zone; periodontal problems extending subgingivally; malocclusions, especially when supernumeraries are involved, and endodontic complications, which are frequent because of the reduced thickness of enamel and dentin. (Tsisis *et al.*, 2003) The anatomy of fused teeth varies, and may be present with separated or fused coronal pulp chambers. Fused teeth are usually present in the anterior region and can cause esthetic problems, including: (1) diastema; (2) crowding; or (3) protrusion. If 2 normal teeth fuse, the resulting conjoined tooth may occupy less space than 2 single teeth. Radiographic examination is an essential part for the treatment of endodontic problems. The amount of information gained from conventional radiography as well as digital radiographs is limited by the fact that the 3D anatomy of the area is pressed into a two dimensional image. These problems can be overcome by the use of CT, which delivers 3D images of individual teeth and can be helpful to achieve a better understanding of root canal morphology. This technique seems to have the potential to help visualise the topography of root canals and offer new perspectives for dental images of special clinical case. (José Francisco *et al.*, 2013) It underpins all aspects of endodontic treatment from diagnosis and treatment planning to assessing outcome. Working in a crown-down manner and coronal preflaring has many advantages. It removes coronal interferences and dentin overhangs, removes bulk of infected dentin from the top part of the canal first, thereby reducing stress on endodontic instrument and preventing unwanted episodes of instrument separation, canal blockage, perforations and transportation. It facilitates enhanced irrigation penetration, rapid development of an apical stop, thus decreasing chances of flareups, saving time and

ultimately better prognosis of teeth. Clinically, it is often difficult to differentiate between fusion and gemination of teeth especially when a supernumerary tooth is fused with a permanent tooth. Fusion between supernumerary and permanent teeth occurs less frequently than fusion between other types of teeth. To help distinguish between fusion and gemination, counting the teeth in an arch and including the anomalous crown as an additional tooth has been suggested. A full complement of teeth indicates gemination, whereas one tooth less than the normal number indicates fusion. This rule does not apply if a normal tooth fuses with a supernumerary tooth, because the anomaly in this case might represent the twinning of a normal and a supernumerary tooth. (Sachdeva *et al.*, 2012) The choice of treatment for a fused tooth should be decided by the patient's orthodontic, periodontal, esthetic, and functional requirements. Usually a multidisciplinary treatment is required due to the: (1) abnormal crown shape; (2) root formation; (3) endodontic considerations; (4) malalignment; and (5) esthetics. The most common treatment alternatives are:

- Extraction of the fused tooth;
- Separation of the conjoined tooth into 2 single teeth;
- Hemisection and extraction of one tooth half; or
- Reshaping of the crown.

Conclusion

The present case report describes the treatment of a fused maxillary left right incisor with supernumerary teeth. In fused teeth, treatment protocols require special attention owing to the abnormal morphology of the crown and the complexity of the root canal system. Apart from clinical, radiographic and CT examinations, the enhanced illumination and visibility obtained with an operating microscope together with the skill of a trained endodontist should be considered as a guarantee to predictable successful results.

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