

Fusion of Central Incisors with Supernumerary Teeth: A 10-year Follow-up of Multidisciplinary Treatment

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Abstract

Introduction: Macrodonia of anterior teeth may occur as an isolated condition or as a result of fusion or gemination and may cause clinical problems such as tooth crowding and esthetic problems. Preliminary planning and careful management are often required by a dental team comprising an orthodontist, an endodontist, a prosthodontist, and an oral surgeon. A multidisciplinary treatment approach in a case with fused teeth is presented.

Methods: A 9-year-old girl presented with macrodonia of a left maxillary central incisor. The patient was referred to the orthodontic department because of a large central incisor as a result of fusion with an unspecific supernumerary tooth. The surgical procedure included sectioning off the mesial segment as far as possible, both apically and subgingivally, and extracting 1 of the fused supernumerary teeth. During the sectioning procedure, the pulp of the remaining tooth was exposed at the middle third of the root. Direct pulp capping was performed by an endodontist using mineral trioxide aggregate. Twelve weeks later, orthodontic treatment was commenced, and finally after a 26-month orthodontic treatment period, the central incisors' crown was restored using composite material. **Results:** A 10-year clinical and radiographic follow-up revealed that the remaining resected central incisor kept its vitality, and the patient was pleased with the esthetic result. **Conclusions:** Proper interdisciplinary treatment planning of complicated cases such as anomalous teeth, which involve fusion to a supernumerary tooth, may lead to minimal invasive conservative procedures that maintain tooth vitality and result in a pleasing esthetic result. (*J Endod* 2014;40:1020–1024)

Key Words

Central incisor, mineral trioxide aggregate, orthodontic, tooth sectioning

Occasionally, orthodontists and general dentists encounter patients with macrodonia of anterior teeth as a result of fusion or gemination of maxillary incisors. It is extremely difficult to restore the natural look of such a wide tooth. Furthermore, if a macrodontic tooth is left in the dental arch, it may severely compromise the eruption of adjacent teeth causing occlusal alteration. Fusion and gemination are anomalies with close similarity inherited by different etiologies (1). Fusion is a “double” tooth resulting from the union of 2 adjacent tooth germs (2). According to Regezi et al (3), it may involve the entire length of the teeth or the roots only, in which case cementum and dentin are shared. Root canals also may be separated or shared, which may lead to a reduced number of teeth or may occur between a normal and supernumerary tooth. Concrescence is a form of fusion in which the adjacent, already formed teeth are joined by cementum, which may take place even before the eruption of teeth.

Gemination is a disturbance during odontogenesis in which partial cleavage of the tooth germ occurs and results in a tooth that has a double or “twin” crown, it is usually not completely separated, and a common root and pulp space is shared (2). Gemination is an aborted attempt of a tooth bud to divide, and unlike fusion, the root and root canal remain undivided. The typical result is partial cleavage with the appearance of 2 crowns that share the same root canal (3). The prevalence of these anomalies is reported to be less than 1%, occurring predominantly in incisors and canines with apparent equal distribution between the 2 jaws, and more common in deciduous teeth (4).

Macrodonia of anterior teeth, whether caused by fusion or gemination, creates problems of crowding and esthetics. The absence of vertical to horizontal crown size harmony (referred to as the “golden proportions”) is disturbing and esthetically unacceptable. Orthodontists' treatment planning requires special attention, and such planning should be performed by a multidisciplinary consultation team comprising endodontists, prosthodontists, and oral surgeons to determine the best treatment approach with the most acceptable outcome. When the treatment includes sectioning off the tooth, part of it may be left intact. In this case, a possible communication between the pulp chambers and/or root canal systems should be considered, and an endodontic specialist should be involved in the process. Proper treatment by an endodontic specialist may include pulp capping using mineral trioxide aggregate (MTA) and avoidance of a complete root canal procedure.

Preserving the dental pulp or part of it in a healthy state is important in treating teeth with exposed vital pulp. MTA is a bioactive biocompatible material capable of sealing the pathways of communication between the root canal system and the external surfaces of the teeth and creating an ideal environment for healing (5, 6). When placed in direct contact with pulp tissue, it encourages formation of a calcified bridge, thus creating both a mechanical and biologic seal (6).

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The aim of this case report was to describe a 10-year outcome of a combined treatment of a fused maxillary incisor by means of an orthodontic–endodontic–prosthodontic–oral surgery management protocol.

Case Report

A 9-year-old girl was referred for treatment in the year of 2002 while presenting with macrodontia of a left maxillary central incisor because of esthetic complaints (Fig. 1A). The remaining primary and permanent teeth were of normal size and shape, and the number of teeth was not reduced. Family and medical history were noncontributory.

Clinically, the maxillary left central incisor and an unspecific supernumerary tooth appeared as fused teeth at the cervical third of the crowns, whereas separated roots could be diagnosed in the panoramic and periapical views (Fig. 1B and C [see arrows]). This may also be considered gemination with a deep vertical groove dividing the tooth in the coronal two thirds to 2 conical-shaped parts wherein the distal segment was wider. The total mesiodistal width of the fused left crown was 15 mm compared with 10 mm of the right (normal) central incisor crown. The resulting dental crowding of the maxillary incisor region caused a shifting of the fused distal segment toward the buccal (distobuccal rotation) compared with the mesial segment (Fig. 1). The vitality test was conclusive, showing a normal response to the cold test (Endo Ice; Hygenic, Akron, OH).

Radiographically, 2 distinct roots united by the cementum were apparent (Fig. 1B and C), and a diagnosis of normal pulp with normal apical tissues and fusion of the left central incisor with an unspecific supernumerary tooth was established by means of clinical and radiographic examination.

The surgical treatment plan included sectioning off the mesial segment as far as possible, both apically and subgingivally, in order to extract the mesial (small) fused tooth. The procedure was performed under local anesthesia. No premedication was required. No special preparation of the oral cavity was implemented. A full-thickness buccal and palatal gingival mucoperiosteal envelope flap was performed (Fig. 2A). A sharp osteotome was placed at the incisal notch groove site aligned obliquely (distally) to the long axis of the root in order to section the crown and part of the root. A sharp tap with a mallet sectioned off the undesirable part of the oversized crown (fused supernumerary). The plane of the separation was terminated subgingivally as preoperatively desired and directed by angling the osteotome.

During the sectioning, a 4-mm-wide oval hole was observed at the midthird of the root, and the pulp was observed through it. The hole was filled with MTA using a dental spatula and burnished on the root surface to facilitate direct pulp capping (Fig. 2B). Before flap suturing, nonrotary bone contouring was performed to remove sharp margins and to enable tight covering of the original gingival tissue over the MTA site.

After a 12-week asymptomatic follow-up period (Fig. 3A), the orthodontic treatment was initiated. The patient was diagnosed with skeletal class II and an Angle class II division I malocclusion. The pattern of jaw growth was normal, and a slightly constricted maxilla was diagnosed; however, no crossbite was recorded. Maxillary incisor dental crowding was noted. Orthodontic treatment extended over a period of 3.5 years (Fig. 3C). After achieving all orthodontic goals, composite restoration was applied to the sectioned maxillary central incisor in order to achieve final esthetics by mimicking the right central incisor



Figure 1. The preoperative macrodontic maxillary left central incisor fused to an unspecific supernumerary tooth. (A) The intraoral frontal view. (B) The panoramic radiograph view. (C) The periapical radiograph view. The arrows point to the separate root.

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