Macrodontia of maxillary central incisors: case reports

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Two cases of maxillary anterior macrodontia, resulting from fusion and gemination, were treated orthodontically. Problems of esthetics and overjet were solved in the first patient by sectioning and extraction of a fused mesiodens, and in the second patient by treating toward an Angle Class III buccal occlusion.


Introduction

Macrodontia of anterior teeth may result from fusion or gemination and can occur in the primary or permanent dentition or both. Fusion is believed to be a union between dentin and/or enamel of two separately developing teeth, leading to a reduced total number of teeth. Fusion may be total or partial and may also occur between a normal and a supernumerary tooth. Prevalence varies between 0.5% and 2.5% and appears to be a dominant trait in some families.1,2 Gemination is an aborted attempt by a tooth bud to divide. As with fusion, gemination occurs mainly in the incisor area, but, unlike fusion, the root and root canal remain undivided. A notch or groove on the coronal surface gives evidence of the attempted division, and the total number of teeth remains normal.1,2 Concrecence is the union of two root surfaces by cementum only.2

Fusion or gemination may be associated with other dental anomalies, such as dens en dente, macrodontia, hypodontia, and supernumerary teeth, and nondental anomalies, such as syndactyly and nail disorders.3 An association between fused teeth in the primary dentition and subsequent fusion and macrodontia in the permanent dentition has been described.3–6

Macrodontia of anterior teeth, whether caused by fusion or gemination, creates problems of crowding, esthetics, and plaque accumulation because of surface notching.7 For the orthodontist, additional problems of tooth interdigititation and overjet reduction require special treatment planning. Two case reports involving fusion and gemination are presented.

Case 1

An 11-year-old boy presented with a mild Class II, division I, malocclusion and a severe bilateral space shortage for maxillary canines. Contributing to this space shortage was an oversized maxillary right central incisor (12 mm mesiodistal) and an even larger maxillary left central incisor (15 mm) (Fig 1). The remaining primary and permanent teeth were of normal size and shape. The overbite was 3 mm and overjet 5.5 mm. The maxillary left central incisor had a deep, vertical groove on the labial and lingual surfaces, that divided the crown into a one-third mesial segment and a two-thirds distal segment. The maxillary right central incisor had an incisal notch in the central part of the incisal edge (Figs 1 and 2). Radiographs revealed two distinct roots of the left incisor that were probably united by cementum (Figs 3 and 4). The diagnosis was late fusion of the left central incisor with a mesiodens and an early gemination of the right central incisor. Family and medical history were noncontributory.

Surgical exposure of the left fused incisor confirmed the clinical diagnosis, and the smaller mesial segment was sectioned and extracted (Fig 5). The root surface
Figs 1 and 2  Oversized maxillary right and left central incisors and their grooves.

Figs 3 and 4  Radiographs reveal one large root and root canal in the right central and a divided root and root canal in the left central.

Fig 5  Postsurgical view of the extracted mesial segment of the left central incisor.
Clinical Communication

Figs 6 to 9 Posttreatment views.

Fig 7

Fig 8

Fig 9

and enamel of the remaining segment were polished, and healing was uneventful. Orthodontic treatment was instituted and completed on a nonextraction basis because the patient diligently wore his cervical headgear. Final facial photographs demonstrate esthetically pleasing dental and facial results (Figs 6 to 9). Dental esthetics will be further enhanced by repair of the fractured incisal edge of the maxillary right central incisor with composite resin.

Case 2

A 12-year-old boy presented for orthodontic consultation with a basic Class I malocclusion, characterized by a lingually blocked-out maxillary left lateral incisor, excessive overjet (5 mm), and an overbite of 3 mm. The mandibular arch, aside from a slipped contact between the right central and lateral incisors, was normal and required no orthodontic intervention. The maxillary space shortage and excessive overjet were both due to the oversized central incisors, which measured 14 mm each (mesiodistally). Longitudinal grooves were present along the labial and lingual surfaces (Figs 10 and 11). Radiographic examination revealed one large root and one large root canal for each tooth, indicating gemination (Figs 12 to 14). The
Figs 10 and 11  Grooved and oversized maxillary central incisors result in space shortage for the left lateral incisor.

Figs 12 to 14  Radiographs show one large root and root canal for each maxillary incisor.
Completed orthodontic treatment resulting in a slight Class III buccal occlusion.

remaining teeth were normal in size, shape, and number. Family and medical history were noncontributory.

The overjet was reduced and the space needed for the maxillary left lateral incisor was gained by distal repositioning of the maxillary buccal segments and finishing with a slight Class III molar and canine relationship. This was accomplished by headgear therapy and maxillary arch treatment only. The results are shown in Figs 15 to 17.

Discussion

The presence of an abnormally sized anterior tooth presents a challenge to conventional orthodontic treatment planning. The orthodontist cannot think in conventional terms of fitting the cusps and inclined planes of posterior teeth in “ideal occlusion” so that normal anterior relationships can follow. Undersized maxillary anterior teeth may dictate a buccal occlusion toward Angle Class II (gnathologic occlusion, in prosthetic terminology), while oversized maxillary anterior teeth may dictate a slight Angle Class III buccal occlusion. Matching maxillary and mandibular midlines may not be possible, and “ideal” overbite and overjet measurements may be compromised.

These two patients with oversized maxillary anterior teeth were treated by different means. In case 1, sectioning and removal of the fused mesiodens allowed a normal Class I occlusion and better esthetics. In case 2, establishing an occlusion toward an Angle Class III relationship allowed a reduction in overjet that would not otherwise have been possible.

References