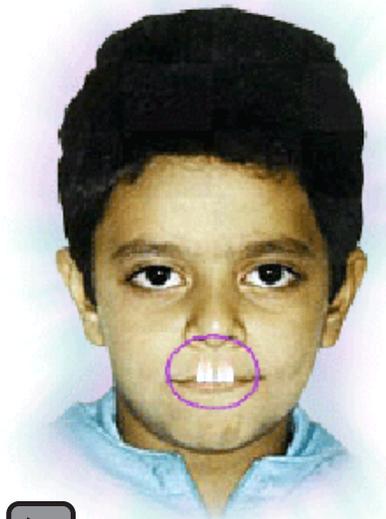


Orthodontic Treatment of Fused and Geminated Central Incisors: A Case Report

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Abstract

A 10-year old Egyptian male presented with a geminated upper right central incisor along with a fused and rotated upper left central incisor in cross bite. He also had severe crowding in the maxillary arch and a congenitally missing lower right first permanent premolar. Orthodontic treatment was carried out to align upper right and left central incisors, lateral incisors, and canines. Treatment options were discussed.

Keywords: Geminated teeth, fused teeth, orthodontic treatment, cross bite

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Introduction

Fusion and gemination are terms which describe “double teeth.” Gemination; means two separate morphological units were created by division of the tooth germ.¹ The result is the incomplete formation of two teeth. The resultant structure is usually one with two completely, or partially separated crowns having a single root and root canal. It occurs in the deciduous and permanent dentition.²



On the other hand, fusion is a developmental anomaly which occurs due to a union of one or more adjacent teeth during development.¹ Fusion may be either complete or incomplete. The tooth may have separate or fused root canals. The condition is common in the deciduous as well as in the permanent dentition.²

The etiological factors related to many dental anomalies are still uncertain. The changes in

tooth form can be hereditary or caused by disease or trauma.³ It is not always possible to differentiate between gemination and a case in which there has been fusion between a normal tooth and supernumerary tooth.²

Knezevic et al.¹ examined 3517 plaster models to find the prevalence of double teeth (fusion and gemination) among the persons tested as to gender, distribution in the maxilla or mandible, and whether the anomaly occurred bilaterally or unilaterally. The results of their investigation have shown a prevalence of double teeth was 0.2%; 57.2% of them were fused and 42.9% geminated.

Case History

A healthy, 10-year old Egyptian male presented to the orthodontic clinic with a chief complaint of the presence of two large front teeth. The medical history was not relevant.

Clinical Examination

Extra-oral examination revealed a symmetrical proportionate face and convex profile. (Figure 1) Intra-oral examination indicated the patient was in the mixed dentition stage with a Class I molar relationship, normal overjet and overbite, and rotated upper left central incisor (FDI 21). Teeth 21 and 22 were in cross bite, while tooth 12 had not yet erupted. The upper arch was U-shaped, while the lower jaw was parabolic.

The two abnormal incisors presented nothing of significance incisally. The crowns were similar in shape, but the left central incisor was slightly



Figure 1. Pretreatment extraoral views.

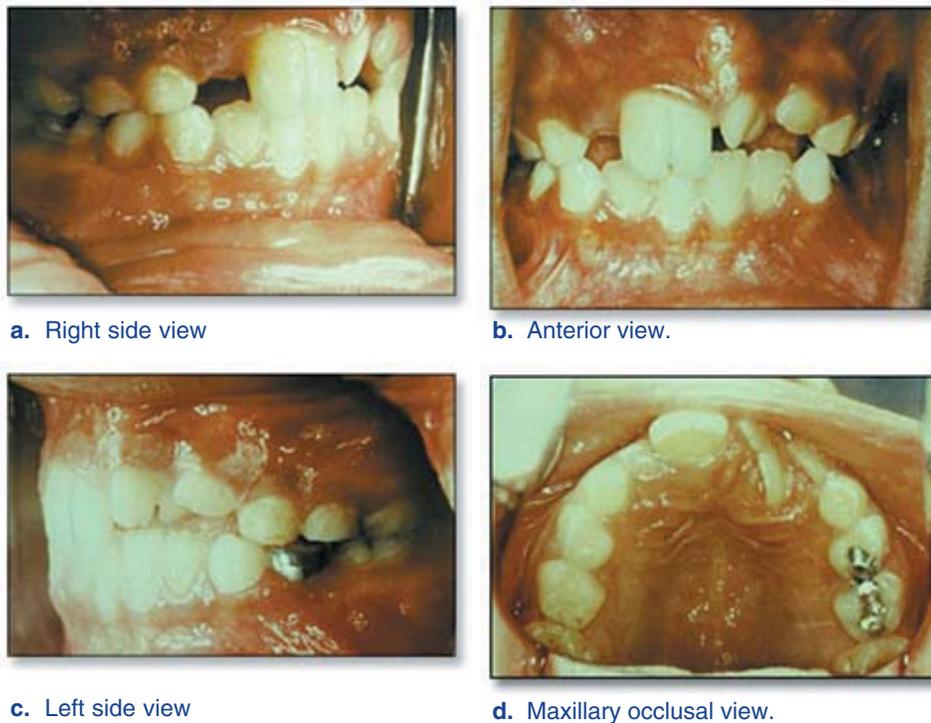


Figure 2. Pretreatment intraoral views.

wider than the right central. There was a midline shift in the lower to the right. Teeth 63, 65, 85, 74, and 75 were restored. Oral hygiene was fair. (Figure 2. a, b, c, d)

Radiographic Examination

The cephalometric radiograph revealed skeletal Class II (ANB = 7 degrees) and a normal maxillary mandibular plane angle (ML-NL = 24



Figure 3. Pre-treatment cephalometric radiograph.

degrees). (Figure 3) The periapical views of the upper incisors showed the crowns of the left central incisor fused with a supernumerary tooth and had two root canals and two separate roots. On the other hand, the right central incisor had a single root, with union of the coronal and radicular pulps. (Figure 4. a, b)

The orthopantomograph revealed the presence of normally developed other permanent teeth except the lower right first premolar which was congenitally missing. (Figure 5)

Treatment

The aims of treatment were as follows:

1. Correct the skeletal relationship
2. Maintain Angle Class I molar relationship
3. Maintain the overjet and overbite
4. Correct the cross bite and rotated 21
5. Correct the midline
6. Align the teeth in both arches and achieve good intercuspation

Before initiating treatment, all treatment options were discussed with the parents. They preferred the option of retaining the two double incisors.

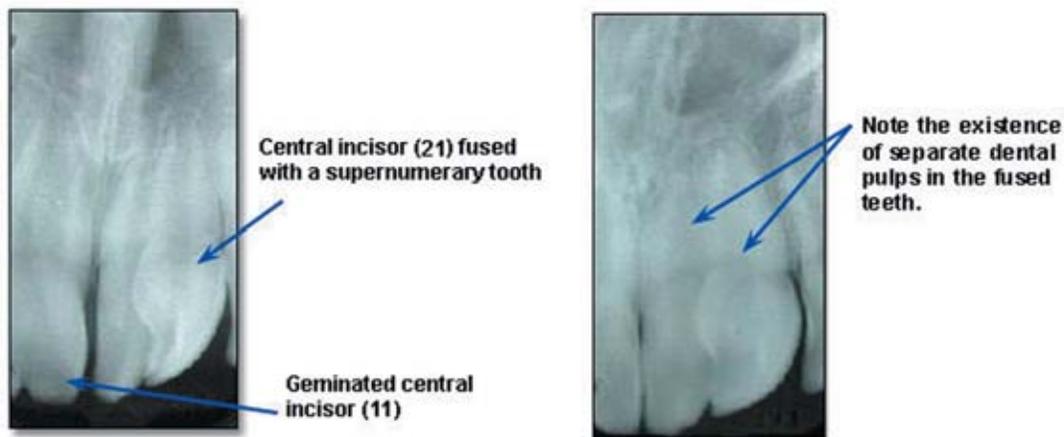


Figure 4. a, b. Pre-treatment periapical views.

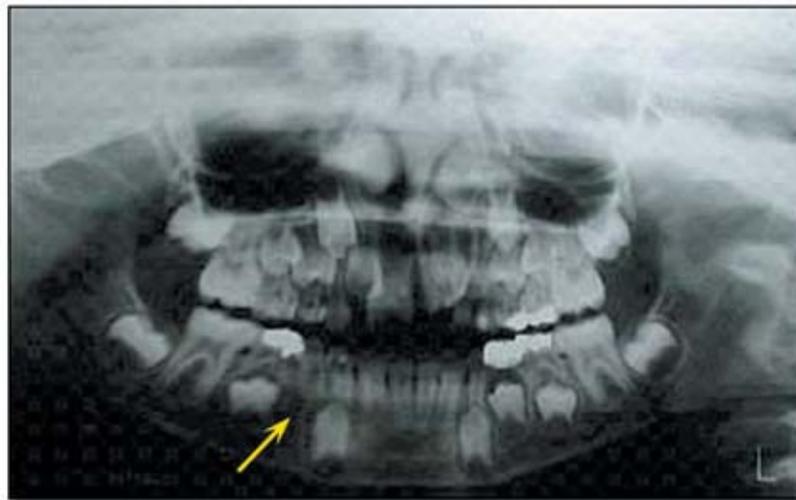


Figure 5. Pre-treatment orthopantomograph. (Arrow indicates the congenitally missing Tooth #44 FDI.)

1. The correction of the rotated 21 initiated with the extraction of both deciduous canines followed by the insertion of a removable appliance with a posterior bite raising plate and a Z-spring contacting the distal aspect of the crown. The appliance was used to tip the distal aspect labially while keeping the acrylic in contact with the mesial side of the tooth to prevent distal tipping. This procedure will continue until 21 is in an edge-to-edge relationship.
2. A 0.018 slot fixed appliance (2 x 4) was used to distalize 22 in order to give space for tooth 21 to be aligned. (Figure 6)
3. When all permanent teeth erupt, the lower arch was bonded as well as the remaining teeth in the upper jaw.
4. Extraction of both upper first permanent premolars was performed to relieve the crowding

and to give space for the permanent canines to erupt.

5. Treatment was discontinued because of the departure of the patient and his family from the country. (Figure 7. a, b and Figure 8. a, b, c, d)

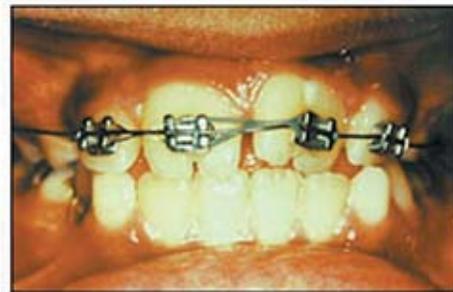


Figure 6. Intra oral view during correction of the rotated upper left central incisor with a 2 x 4 fixed orthodontic appliance.



A. Anterior view.



B. Right side view.

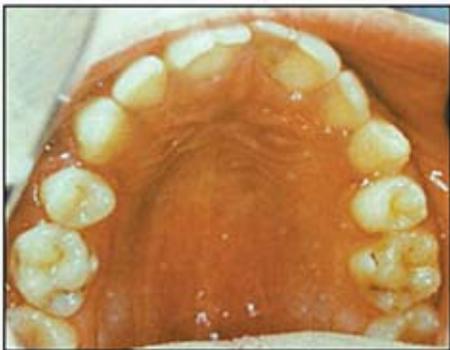
Figure 7. Extraoral views at the time of debonding.



a. Anterior view. (Patient positioned the mandible forward.)



b. Left side view.



c. Maxillary occlusal view.



d. Mandibular occlusal view.

Figure 8. Intraoral views at the time of debonding.

Discussion

A geminated maxillary incisor requires complex multidisciplinary treatment to preserve its health and restore esthetics.³

There are different treatment approaches of cases with fused and geminated central incisors.

Esthetic quality is usually the determining factor regarding the decision to retain or extract these teeth.⁴

One possible treatment involves their extraction with approximation and conversion crowning of suitable adjacent teeth.⁵ The second option is

surgical division of the double teeth when the degree of fusion is mild.^{6,7} A third option is selective grinding in order to reduce the width.⁸ A fourth option is to remove these teeth and replace the extracted teeth with an interim removable partial denture until they can be replaced with a fixed bridge or an implant. In certain circumstances like the present case, retention of the fused and geminated teeth may be acceptable when other treatment options are not suitable.

Conclusion

Although the treatment was not completed, the esthetic, prophylactic as well as the psychological and functional objectives were achieved. The patient and the parents were satisfied with the outcome.

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