



## Multidisciplinary Management of Fused Maxillary Central Incisors- Case Report of a Single Case

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### Abstract

Fusion is a dental anomaly that arises through the union of two adjacent teeth. This case report presents a unique case of fusion of maxillary incisors bilaterally with supernumerary teeth,

The patient presented to orthodontic clinic with unsightly appearance of his front teeth and upper teeth in front

Clinically the anterior teeth were 20 mm in diameter, rotated and having a middle groove. Radiological examination through IOPA and OPG confirmed the fusion of maxillary central incisors with supernumerary teeth bilaterally at the level of middle of roots.

The fused teeth were treated with combination of endodontic, surgical and orthodontic treatment which included endodontic treatment of teeth no 11 and 21 followed by surgical excision and extraction of supernumerary teeth. After this correction the orthodontic treatment was ensued.

Systematic treatment with multidisciplinary approach helped to change a challenging case to a routine and less complicated orthodontic treatment. More ever, it helped the patient to be esthetically confident with his smile from the beginning of the orthodontic treatment.

**Keywords:** Multidisciplinary; Fused; Maxillary; Central Incisors

### Introduction

Tooth fusion is a rare developmental anomaly that stems from the embryogenic union of two teeth originating from two or more tooth germs [1]. Such anomaly may be complete or incomplete depending on the developmental stage of the associated tooth buds. If contact between two tooth buds occurs before calcification, complete fusion ensues. This may be seen clinically as an abnormally wide crown usually with a groove that separates the mesial and distal moiety. If contact occurs after crown formation, incomplete fusion occurs at the root level. Incomplete fused teeth may present with separate pulp chambers and root canals as was the present case.

Although the exact etiology of fusion is unclear, pressure or physical force producing close contact between two developing tooth buds has been reported as a possible cause, and trauma, genetic and environmental factors have also been implicated as contributing factors [3-6]. Moreover, fused teeth may form part of syndromes such as achondrodysplasia, chondroectodermal dysplasia, focal dermal hypoplasia, and osteopetrosis [7].

The majority of fused teeth show an anomalous broad crown and two distinct root canals. Clinically, the crowns appear melded together, with a small groove between the mesial and distal parts.

Fused teeth may be characterized by one pulp chamber divided into two root canals, two independent endodontic systems, or one common pulp canal.

This case report presents the surgical separation and orthodontic treatment of a maxillary central incisor fused with a supernumerary tooth.

A 12-year-old male patient with an esthetic complaint was referred to our clinic. His medical history had no significant data. On clinical examination, the patient presented with enlarged maxillary central incisors (20mm in diameter), rotations and midline fissure on both labial and palatal sides. The fused teeth have mild tenderness to percussion but not to palpation, and were unresponsive to heat, cold, or electrical pulp testing. Caries was present along the fissure on the palatal surface of the fused teeth molar relationship, canine relationship couldn't be evaluated as permanent canines are still not erupted, cross bite was present in relation both lateral incisors, anterior overjet was of 7mm (Figure 1).

Lateral cephalogram radiograph showed Class II skeletal base with prognathic maxilla and retruded mandible. forwardly placed upper incisors, proclined lower incisors, vertical growth pattern (Figure 2).



**Figure 1:** Pre-operative intraoral photographs. Note the fused 11 and 21.



Lateral ceph - class ii skeletal pattern , proclined upper and lower anteriors , mild hyperdivergence  
 SNA 86.4 (norm-83.4 sd 1.9)- prognathic maxilla  
 SNB - 79.1(norm-81.2 sd 2)- retrognathic mandible  
 ANB -7.3(2.3 sd 1)- class ii skeletal base  
 upper incisors to NA - 27.3 /6.1mm ( normal value - 22/4)- proclined maxillary anteriors  
 lower incisor to NB - 30.7/10.5 mm (normal value - 25/4)- proclined lower anteriors  
 IMPA-95.7 (normal value-90)  
 sngogn-39.5 (normal value -32)- vertical grower  
 jarabak ratio - 67.37 (62-65)

**Figure 2:** Pre-treatment lateral cephalogram.

Panoramic radiograph showed fusion of central incisors with supernumerary moiety at the middle of root level but both teeth had separate root canals and separate pulp chambers with the supernumerary teeth with no periapical radiolucency (Figure 3).



**Figure 3:** Pre-treatment Ortho pantomagram. Note the separate root canals of central incisors and supernumerary teeth.

Periapical radiograph was taken to confirm the level of fusion and to finalize the diagnosis of the fused teeth. From the combined clinical and radiographic examinations, a diagnosis of fused teeth with necrotic pulp, and treatment consisted of endodontic therapy and extraction of the supernumerary teeth with the reconstruction of hard dental tissues followed by orthodontic treatment (Figure 4).



**Figure 4:** Pre-treatment intra oral periapical radiographs. 4a: Intra oral periapical radiograph showing supernumerary teeth (S) in the midline. Note the fusion site in the middle of the root and separate root canals and pulp chambers, 4b: Intra oral periapical radiograph showing tooth no 11 fused to supernumerary tooth, 4c: Intra oral periapical radiograph showing tooth no 21 fused to supernumerary tooth.

The supernumerary tooth was separated from the central incisors at the fusion site and extracted under local anesthesia. Then both central incisors were isolated by rubber dam, access cavity were initiated using round medium sized bur, pulp tissue were extirpated and working length was determined by placing K files size 25 in each canal using apexlocator. The canals were shaped by protaper gold NiTi rotary instrument to size F3 (Dentsply Maillefer, Ballaigues, Switzerland), irrigated with 2 mL of 5.25% Sodium Hypochlorite (Farmácia Amazon, São Carlos, SP, Brazil), and dried with sterile paper points. A Calcium Hydroxide paste dressing (Calen, SSW, Brazil) was placed in the canals and temporarily sealed with cotton pellet and the access temporarily restored by glass ionomer (Fuji IX, GC America, Alsip, IL). After one week the teeth were asymptomatic. The dressing material was removed with 10ml 5.25% Sodium Hypochlorite irrigation followed by a 3-minute rinse with a buffered solution 17% Ethylenediaminetetraacetic acid (EDTA) (Odashcam, Dentsply, Brazil), flushed with saline (5 mL/canal, 1 min) and dried with paper points. Obturation was performed using the lateral condensation technique with gutta-percha and Totalfill BC root canal sealer (FKG Dentaire, La Chaux-de-Fonds, Switzerland)

Orthodontic treatment was aimed at correction of skeletal and dental problem, which was started one month later after endodontic treatment to allow complete healing of the adjacent periodontium.



**Figure 5:** Post -treatment intra oral periapical radiographs.

Figure 5a: Post obturation.

Figure 5b: Post obturation tooth no 21.

Skeletal correction with maxillary headgear appliance was planned but after evaluation the patient compliance level, the treatment was deferred.

Patient was bonded with fixed orthodontic appliance, MBT 022" slot (American Orthodontics, Sheboygan, Wisconsin, United States.) to consolidate the spaces created after extraction of supernumerary teeth, relieve the cross bite, supervise the eruption of teeth. It was planned to bond the mandibular arch after correction of cross bite in the right and left lateral incisors.

Midline diastema of 7mm was present after the extraction, at the time of bonding.

Special care was taken to keep the orthodontic force light and continuous with the periodic evaluation of every one month.

Patient is presently in Stage 1 of treatment with levelling and alignment in progress. After 3 months of orthodontic treatment, the diastema was reduced to 4mm and cross bite in the lateral incisors are corrected. (Figure 6).



**Figure 6:** Intraoral photographs of three month follow up. Note the reduction of overjet and midline diastema.

After 6 months of treatment overjet is reduced to 5mm and midline diastema is reduced to 3mm. This shows a good tooth movement response to orthodontic forces and is comparable to response with untreated teeth. There is no signs of any mobility or gingival recession in the treated upper incisors (Figure 7).



**Figure 7:** Intraoral photographs of SIX month follow up. Note the reduction of overjet and correction of lateral cross bite.

### Discussion

A number of issues, including caries, periodontal disease, aberrant eruption, impaction, and ectopic eruption of an adjacent tooth, can be brought on by fused teeth [8,9]. Severe aesthetic issues arise from fused teeth in anterior locations. Consequently, in order to achieve optimal aesthetics and occlusion, a number of therapeutic considerations have been suggested in the literature [10]. These considerations typically call for interdisciplinary therapy stages. A multidisciplinary strategy was utilized to provide endodontic and orthodontic treatment in this instance.

When two distinct tooth buds unite during the developmental stage, this is known as fusion. Clinically, fusion and gemination share several traits. Differential diagnoses based on the number of teeth in the dental arch can be made. The arch will have all of the teeth in gemination, but in fusion there will be one less tooth than in the regular complement. But it can be challenging to distinguish between fusion and gemination, particularly when these abnormalities occur in conjunction with hypodontia or an extra tooth [11].

A wide range of interdisciplinary methods have been proposed for treating fused teeth, taking into account endodontic, cosmetic, orthodontic, periodontal, and functional issues [12].

The endodontic treatment depends on the anatomy and the number of pulp chamber and canals. In the case where the pulp chambers and canals are separated, separation and extraction of the anomalous tooth with orthodontic closing of the area and re-shaping of the tooth is one of the therapy choices [13]. In the case presented, the aim of the therapy was to create esthetic and functional correction of maxillary central incisors by extraction of the fused supernumerary teeth.

In the present case separation and extraction of supernumerary moieties were done by the endodontist after assessing the risks of treatment which seemed minimal. Orthodontic treatment being done with light continuous forces and periodic evaluation.

Response to tooth movement is good with no mobility, root resorption or any gum recession.

## Conclusion

This case report presents the multidisciplinary management of a rare condition of fused anterior teeth the incidence of which is only 0.1% in permanent dentition.

There are many treatment modalities to manage fused teeth. Selective resection of fused teeth with subsequent orthodontic alignment appears to be an acceptable treatment option in certain cases.

Careful treatment planning and by the use of diagnostic tools the prognosis of both orthodontic and endodontic treatment can be improved.

When patients are young, retention of their natural dentition via a more conservative approach with minimal surgical intervention may be preferred. For such treatment to be successful, treatment planning and consensus between different dental specialties are needed.

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