

# Pulp Therapy of Maxillary Fused Primary Central and Lateral Incisors: A Case Report

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## Abstract

Fusion is a rare anomaly that originates during tooth development and causes an alteration in the number and shape of the affected teeth. Fused teeth are normally more susceptible to caries due to a large number of scratches and gaps at the site of the junction. This case report discusses pulp therapy of maxillary fused primary central and lateral incisors of a 4-year-old boy in which he reported with a chief complaint of persistent and recurrent pus and swelling in the upper front area. Clinical and radiographic examination confirmed the presence of fusion with deep caries involving the pulp with large periapical radiolucency and apical root resorption. Access cavity was made and working length was established, then canals were cleaned using K-files and 2% sodium hypochlorite and root canal filling was completed and the access was restored. Careful clinical and radiographic examination is necessary in treating teeth with such anomaly. This case report of endodontic treatment of the fusion stresses on maintenance of primary teeth until normal exfoliation time to be a crucial factor for esthetic, function, and patient's physical and psychological health.

**Key words:** Fusion, Primary incisors, Pulp therapy

## INTRODUCTION

A thorough knowledge of different anomalies of the teeth, internal morphology, and anatomic variations is essential for successful endodontic treatment. Anomalies, in general, cause major difficulties in diagnosis and treatment of such teeth. Fusion is a common anomaly that is commonly confused with tooth gemination. Both anomalies originate during tooth development and cause an alteration in the number and shape of the affected teeth.<sup>[1]</sup>

Fusion occurs when two or more separately developing tooth buds joined at dentinal level and present as a single large tooth structure. On the other hands, gemination occurs when two teeth attempt to develop from a single tooth bud, but without complete separation.<sup>[2,3]</sup> Etiology of such anomalies is unknown; however, it may be related to genetic predisposition,

racial differences, or impact of trauma during tooth bud development.<sup>[4]</sup>

The incidence of fusion is greater in primary dentition and an anterior area with apparent equal distribution between the two jaws.<sup>[5,6]</sup> It is more common in the anterior region, approximately 0.1% occurs in permanent and 0.5% in primary dentition, with an equal distribution in females and males, among Caucasians.<sup>[1]</sup>

Clinically, fused teeth are normally more susceptible to caries and periodontal problems because they present a large number of scratches and gaps at the site of the junction.<sup>[7]</sup> The groove between the fused crowns may be located subgingivally with a more bacterial plaque retentive area. Furthermore, fusion could cause misalignment of the adjacent teeth.<sup>[8]</sup> These can lead to multiple clinical problems including early necrosis of the affected teeth, esthetic problems, orthodontic and periodontal issues that may require multidisciplinary treatment approach. In severe cases, treatment may be compromised and achieving bacterial tight coronal seal may not be possible which may lead to tooth loss.<sup>[9,10]</sup>

The present case report discusses an endodontic treatment performed in a primary maxillary central and lateral incisor fused together.

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## CASE REPORT

A 4-year-old boy reported to a mobile dental clinic, in Al-Majardah area Asir Region of Saudi Arabia, in an outreach program organized by the College of Dentistry, King Khalid University. The patient's chief complaint was persistent and recurrent pus and swelling in upper front area. The swelling had started 6 months back and the patient had noticed pus drainage in the upper right anterior region for few weeks. At present, the swelling had reduced in size and the patient has mild symptoms of pain. However, due to poverty, restricted age of father and lack of dental clinic in the neighboring area a proper treatment could not be rendered to the patient.

On clinical examination, intraoral soft tissue looked normal with all primary dentition fully erupted. A sinus tract was present in the mucobuccal fold related to maxillary right central incisor. Maxillary right central and lateral incisors looked larger than normal and fused with V-shaped groove separated the incisal area of crowns. The number of teeth in the first quadrant was only four considering both fused teeth as one unit.

The periapical radiograph [Figure 1] confirmed the presence of fusion of the central and lateral incisor. A deep caries approaching pulp was seen radiographically. Furthermore, a large root canal space in both canals with periapical radiolucency and apical root resorption was evident.

At the first appointment, isolation was done with cotton rolls and gauze due to lack of rubber dam supply in the outreach program and also due to lack of the patient cooperation. Without using local anesthesia, all caries were removed, access cavity was made with high-speed handpiece using a size #2 round bur. Working length was established and confirmed with a periapical radiograph [Figure 2]. The estimated working length was 10 mm in mesial canal and 12 mm in the distal canal. Canals were then debrided using hand K-files till size #30 with simultaneous copious irrigation with 2% sodium hypochlorite (NaOCl). Canals were dried using absorbent paper points and filled with freshly mixed calcium hydroxide  $\text{Ca}(\text{OH})_2$  with normal saline as an intracanal medication and closed with @Plastor (Ghimas, Italy) as a temporary filling. A periapical radiograph was taken to confirm the length and density of  $\text{Ca}(\text{OH})_2$  [Figure 3]. The patient was recalled after 2 days for review and completion of treatment.

At the second appointment, the patient was asymptomatic and the sinus tract had disappeared completely. After isolation with cotton rolls and gauze, the temporary filling was removed with a high-speed handpiece and



Figure 1: Pre-operative radiograph showing the fused teeth



Figure 2: Working length radiograph showing the extension of K-files in the root canal system



Figure 3: Calcium hydroxide radiograph showing the medication in the root canal system

a size #2 round bur. The  $\text{Ca}(\text{OH})_2$  from the canals was removed using hand K-files and 2% NaOCl irrigation simultaneously. Canals were then dried using absorbent

paper points. Root canal filling was completed in the same visit using @Metapex (Meta Biomed, Korea) an injectable silicone oil-based  $\text{Ca}(\text{OH})_2$  past with 38% iodoform. The excess paste was removed from the pulp space using alcohol swab. The access cavity was restored using composite filling and a post-operative periapical radiograph was taken [Figure 4].

## DISCUSSION

Identification of the possible anatomic variations is very important; similarly, it is as important to know anomalies present in all tooth groups. Tooth fusion is one anomaly which causes difficulty in diagnosis and treatment and also is sometimes confused with germination.<sup>[11]</sup>

Fusion of developing teeth can occur at any stage of tooth development. Tooth fusion is due to the union of two separated tooth germs. Depending on the stages of tooth development and time of union, fusion might be incomplete or complete. Clinical and radiographic appearance will be different depending on the stage of teeth development during fusion.<sup>[12]</sup>

The etiology of these anomalies is still unknown; however, it is believed that trauma or some physical force or pressure causes the contact of developing teeth. Hereditary cause or excess administration of Vitamin A, viral infection, or use of thalidomide drug during pregnancy is believed to be a cause by some authors.<sup>[12,13]</sup>

Various treatment approaches for fused teeth have been suggested based on the endodontic, orthodontic, periodontal, esthetic, and functional problems.<sup>[14]</sup> Whether there are independent pulp chambers and canals or one pulp chamber and two canals will define



**Figure 4: Post-operative radiograph showing the root filling material and final filling**

the endodontic possibility of fused teeth. Surgical separation and restoration of both the fused teeth and selective grinding of the fused teeth are other treatment possibility stated in literature so that the width of the crown is reduced.<sup>[14,15]</sup>

In the present case, the endodontic treatment of two separated root canals of fused teeth is presented. The root canal treatment was completed in two sitting. In the first sitting, an access cavity followed by working length determination and cleaning shaping was done. An intracanal medicament was placed as an interim dressing material. The endodontic treatment was completed in the next visit after the tooth was asymptomatic and signs and symptoms had disappeared.

## CONCLUSION

Fusion of the tooth is a rare anomaly. Careful clinical and radiographic examination is necessary in treating such cases. This case report of endodontic treatment of the fusion stresses on maintenance of primary teeth until normal exfoliation time to be a crucial factor for esthetic, function, and patient's physical and psychological health.

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