

Conservative Treatment of Fused Teeth in Permanent Dentition

Ana Malčić
Goranka Prpić-Mehičić

Department of Dental
Pathology
School of Dental Medicine
University of Zagreb

Summary

Dental fusion is a rare developmental anomaly which is included in the anomalies of tooth size. Fusion can occur at the level of enamel or enamel and dentin which results in the formation of a single tooth with enlarged clinical crown. Etiology of fusion is not fully clarified. According to the available literature, the incidence of fusion ranges from 0.2 to 2.5% and is more common in deciduous dentition. In the case report presented, fused incisors were treated endodontically and reconstructed by composite materials.

Key words: *fusion, incisors, endodontic treatment, conservative therapy.*

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Address for correspondence:

Ana Malčić
School of Dental Medicine
Gundulićeva 5, 10000 Zagreb
Croatia

Introduction

Dental fusion (*fusio dentes, dentes confusi, dentes fusi, synodontia*) is a rare developmental anomaly which is, according to Stewart and Prescott (1) classification of dental anomalies, included in the anomalies of tooth size. It is defined as a joining of two separate tooth buds during odontogenesis at the time when the crown is not yet mineralized, and depending on the developmental stage in which it occurs, it can be complete or partial (2, 3).

Fusion can occur at the level of enamel or enamel and dentin, which results in the formation of one clinically enlarged crown. Fused teeth can have separated pulpal space, one pulp chamber and two canals or take the form of a large bifid crown with one pulpal space. It is hard to differentiate between fusion and gemination, especially if the supernumerary tooth bud is fused with the adjacent one (4).

Etiology of fusion is not fully explained. Some authors state that it is a result of physical forces that

lead to the necrosis of epithelial tissue between the two joining buds, they come into contact and fuse. (5, 6).

According to other authors, fusion is a result of the persistence of the interdental lamina between the two buds during embryological development (7).

Incidence of fusion depends on race, gender and location. According to the available literature its value ranges from 0.2 - 2.5% and is more common in primary dentition (8-10).

Case report

A patient, aged 52 years, had been sent to the Department of Dental Pathology for endodontic treatment of fused upper right incisors prior to prosthodontic therapy. The main reason for coming to the dentist was bad aesthetics of the upper frontal region.

Clinical finding

Vitality test (cold test) was used to determine that the fused teeth were nonvital. They were slightly sensitive to percussion. There was no palpative sensitivity in the projection of the apices. The clinically enlarged crown had composite fillings: 3rd class (mesially and distally) and access opening on the palatal surface of the lateral fused incisor. Enamel was missing on almost one quarter of the labial surface, the exposed dentin was sclerosed and caries was present in some places along the enamel-dentin junction (Figure 1).

Radiologic finding

Periapical intraoral radiogram confirmed the fusion of the upper right incisors with separated endodontic spaces, including two pulp chambers and two canals. A part of the crown corresponding to the central incisor was smaller and the root was shorter. Periapical transparency suggested a chronic periapical process. The fused central incisor had not been endodontically treated earlier while the root canal filling in the lateral fused incisor was not sufficiently homogenous and was too short (Figure 2).

Treatment procedure and therapy outcome

Treatment consisted of endodontic therapy and the reconstruction of hard dental tissues using composite material including labial veneers. The treatment was performed between January 19th and February 11th (three visits).

After caries removal two access openings were made (Figure 3). Root canals were cleaned and shaped by step-back technique and filled by the technique of cold lateral condensation (Figure 4).

One week after endodontic therapy, the teeth were etched, rinsed and treated with a mixture of sodium- perborate and 30% hydrogen- peroxide during five minutes and acting of polymerisation light during one minute. After bleaching, hard dental tissues were reconstructed by composite materials. The separation of the fused teeth was simulated by fissure on the labial surface (Figure 5).

In the third visit, old composite fillings of teeth 13 and 21 were replaced and the composite resin of

fused incisors 12 and 11 was additionally polished. Unfortunately, the patient did not call in for a further check-up, so we do not have any information on how the teeth look today, and we can attach only photographs taken just after the treatment.

Discussion

It is difficult to clinically make differential diagnosis between fused teeth (fusion) and gemini teeth (gemination), especially when these anomalies take place together with hypodontia or supernumerary tooth. For example, gemination of the central incisor in combination with hypodontia of the lateral incisor can impinge as fusion of the lateral incisor. The term "double tooth" is therefore preferred by many authors.

In the literature many different multidisciplinary approaches in the therapy of fused incisors were suggested dependent on whether there are independent pulp chambers and canals or one pulp chamber and two canals. The aesthetic criterion is the determining factor when choosing therapy. In the case where the pulp chambers and canals are separated, some authors propose separation and extraction of the anomalous tooth with orthodontic closing of the space and reshaping of the teeth (11, 12). Others propose surgical separation with restoration of both teeth (13, 14). The third possibility stated in the literature is selective grinding of the fused teeth so that the width of the crown is reduced (15).

In the presented case we did not separate the fused teeth but merely simulated separation on the labial veneer by fissure. We assessed the aesthetic effect to be satisfactory, and by the endodontic treatment a prerequisite for prosthetic therapy was made, in the case the patient decided to take such a solution.

Conclusion

By using conservative therapy aesthetic and functional criteria were satisfied. The patient was satisfied with the outcome of the therapy and with its financial component.