

# Anomalies In Teeth Development - Gemini Teeth And Fusion - Two Clinical Cases

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## ABSTRACT

Anomalies in tooth development are variations in the number, shape, size and structure of dental structures. First clinical case: A 6-year-old girl attends the Department of Pediatric Dental Medicine at the Faculty of Dental Medicine, Medical University of Varna for prophylactic examination. Intraoral examination revealed the presence of an unilaterally unusually large tooth in the region of the upper left central primary incisor of the upper jaw. A status localis intraoralis showed the presence of a twin primary tooth 61. Second clinical case: A 3-year-old girl attends a clinic at the Department of Pediatric Dental Medicine for a prophylactic examination, with complaints from parents that she has a larger and different primary tooth in her lower jaw to the right. The intraoral examination revealed the presence of an unilaterally unusually larger temporary tooth in the area of the lower right lateral incisor and the canine region. On clinical examination, the site strongly indicates a primary lateral incisor and canine fusion 82 and 83. Dental anomalies are a health and psychological problem for dental patients and parents. Fusion of teeth or fusions most often results in a reduced number of teeth in the tooth row. The fusion of teeth in our case is one-sided and affects the primary dentition.

**Keywords:** *gemini teeth, tooth fusion, anomalies*

## INTRODUCTION

Anomalies in tooth development are variations in the number, shape, size and structure of dental structures. The reasons may be entirely genetically predetermined, be the result of local or systemically acting environmental factors and ultimately a combination of these factors. Defects in shape are detected after the action of various etiological factors during the initiation, proliferation and morphodifferentiation of the dental embryo.

Twin teeth or dentes geminate are a defect that results from incomplete separation of the tooth bud, resulting in the formation of two partially or completely separated crowns with one common root. In cases where this separation is complete, this anomaly is called geminatio or double, which is the reason for the formation of supernumerary tooth. This supernumerary tooth is clinically seen as a smaller copy of its prototype.

The defects of the twin teeth and the fusion of the teeth (Fusio) occur with a lower incidence of primary tooth 0.5% - 1.6%, and at permanent 0.1% - 0.2%. It has been found that in 30-50% of cases of primary teeth the defect is also observed in permanent teeth. Upper and lower incisors are most commonly pathologically affected. Clinical dental gemination has the following options - minimal indentations on the cutting edge of apparently wide crowns to almost completely split into two parts clinical crowns. Similarly, the pulp chamber and the root canal of the tooth can be shared (inseparable) or separated and separate (1).

Knezevic A. et al. in 2002 published their research on twin and fusion teeth defects. The results of this study show that in a total of 3517 models studied, the incidence of twin teeth was 0.2%. Of these, 57.2% were fusion and 42.9% were diagnosed with dentes geminate or twin teeth (2).

Tooth fusion is defined as the fusion of two tooth buds, which results in the formation of a tooth with an irregular clinical crown shape. The defect is the result of persistence of the interdental lamina during the development of the dental germ. This is

caused by local factors or delayed disintegration of the interdental lamina. For fusion, genetic factors also have autosomal dominant inheritance with reduced penetration. Again, this pathology mainly affects the front teeth. When the fusion occurs at an early stage of development, it is found along the entire dental length of the crown and root. In these cases, a tooth of almost normal size is formed. However, if the fusion occurs later in histogenesis, the defect only affects the root, which has common dentin and cement. A single tooth is clinically established, but in average (statistically) calculated sizes, it is a larger tooth or is a tooth with a split crown.

According to Patil AA et al., 2014 (3), these types of anomalies, such as tooth fusion, can be one-sided or bilateral and may affect either of the two teeth, although primary dentition are more commonly affected. The incidence of this anomaly is 0.5% in the primary dentition and 0.1% in the permanent dentition (Kelly JR et al., 1978, 4).

Grafting of teeth or **dentes concreti** is a type of fusion for which it is different that the formed teeth only connect along the cement line. This defect could occur before or after a tooth eruption and is probably the result of local trauma, clumping of teeth or dislocation of dental germs during root formation. Dental pathology is rare in the clinic and it affects the upper second and third molars (1).

#### *Description of clinical cases*

##### *First clinical case*

A 6-year-old girl attends the Department of Pediatric Dental Medicine at the Faculty of Dental Medicine, Medical University of Varna for prophylactic examination. Parents' complaints are related to having a large tooth in their upper jaw. Her medical history concludes with clinical health. Intraoral examination revealed the presence of an unilaterally unusually large tooth in the region of the upper left central primary incisor of the upper jaw. A status localis intraoralis showed the presence of a twin primary tooth 61 (Fig. 1A and B). The deep labio-vestibular canal is related to the expanded medio-distal diameter of these teeth.



A



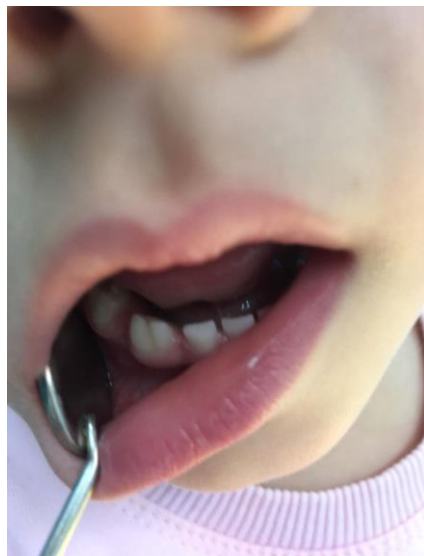
B

Fig. 1. *Dentes geminate of an upper central primary incisor - 61 tooth*

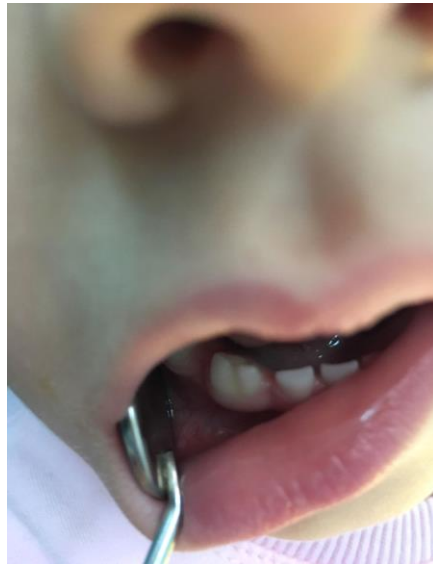
*Second clinical case*

A 3-year-old girl attends a clinic at the Department of Pediatric Dental Medicine for a prophylactic examination, with complaints from parents that she has a larger and different primary tooth in her lower jaw to the right. The patient's medical history was with the conclusion of clinical health. The intraoral examination revealed the presence of an unilaterally unusually larger temporary tooth in the area of the lower right lateral incisor and the canine region. On clinical examination, the site strongly indicates a primary lateral incisor and canine fusion 82 and 83 (Fig. 2. A and B).

The deep labio-lingual canal is connected to the enlarged teeth. Another pathology of tooth defects found by us is: Fusion of teeth or Fusio 82 and 83, (Fig. 2 A and B).



A



B

Fig. 2. Intraoral view showing lateral fusion of mandibular primary lateral incisor and canine - 82, 83 teeth

#### Discussion

Dental anomalies are a health and psychological problem for dental patients and parents. Changes in tooth shape and color lead to social isolation and low self-esteem for infants. Genetic research and the search for "defects" in genes can create a "comfort" for parents. Therefore, the dental specialist should theoretically and in clinical practice in these cases be well aware of the various defects in the construction of the teeth, delicately investigate and identify the causes of their occurrence and suggest clinical decisions for their treatment.

Dental geminations are found in both the primary and permanent dentition. They are the result of different degrees of invagination of the developing dental organ. The genetic factors that influence are likely to be similar to those affecting lamina dentis in patients diagnosed with hyperdontia.

According to Singh VP et al. (5) in a 2011 publication reports that fusion of teeth (fusio dentes, dentes confusi, dentes fusi, synodontia) is a rare developmental anomaly, which according to the Neville's classification of two dental anomalies (Neville BW et al., 2005, 6) is included in the tooth size anomalies. It is defined as the union of two separate tooth buds during odontogenesis, at a time when the crown is not yet mineralized and depending on the stage of development in which it occurs. Dental fusion may be complete or partial (Singh VP et al., 2011, 5). Dental fusion frequency also depends on race, gender, and location. According to the available literature, it ranges from 0.2 - 2.5% and is more common in primary dentition (7-13).

The fusion may occur between normal teeth or between normal and supernumerary teeth. In these cases, too, it is difficult to make a differential diagnosis between fusion and gemination. The fusion of permanent and supernumerary teeth occurs less frequently than the fusion between permanent teeth. Hachisuka, in his study, found that the incidence of fusion between permanent and supernumerary teeth was 0.1% and that this type of fusion usually included the anterior teeth of the upper jaw (Hachisuka Toshiya, Numerical analysis, 14,15).

The importance for the clinic is that a fusion in the primary dentition can lead to aplasia of the permanent tooth (1).

#### CONCLUSION / CLINICAL SIGNIFICANCE

1. Dental anomalies are a health and psychological problem for dental patients and parents.
2. Fusion of teeth or fusions most often results in a reduced number of teeth in the tooth row.
3. The fusion of teeth in our case is one-sided and affects the primary dentition.

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