

## **Rotation of 180 Degrees of Bilateral Mandibular First Molars in Pediatric Patient: A Case Report**

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### **Abstract**

Tooth rotation defined as an intra-alveolar rotation mesiolingual or distolingual of the dental element around its long axis. Rotation of a tooth around an axis which is perpendicular to the occlusal plane through angles which approach 180° is a rare anomaly which is found in the human dentition.

There are several hypotheses about its origins in the literature, such as heredity, hyperactivity of the dental lamina, a division of normal tooth germ, activity of the remnants of dental lamina and Hertwig epithelial root sheath, lack of space for normal eruption, genetic mutations by interacting with environmental factors such as trauma, local infection and radiation, nutritional deficiencies. In addition, an impairment in bone development of dental arches could lead to disturbances in the positioning of the teeth.

Despite the presence of several articles in the literature citing varying degrees of malalignment, complete 180 degrees rotation of bilateral mandibular first molars are not reported up to our knowledge. This report proposes to describe a rare condition of rotation of 180 degrees of bilateral mandibular first molars in pediatric patient with no history of trauma or any other dental anomaly in the oral cavity.

**Keywords:** *Rotation; 180 Degree; Anomaly*

### **Introduction**

The 180 degrees rotation defined as an intra-alveolar rotation of a tooth around its long axis which is perpendicular to the occlusal plane through angles that approach 180 degrees [1]. The 180 degrees rotation is a rare anomaly which is found in the human dentition [1]. This anomaly is caused by genetic mutations which lead to hyperactivity of the dental lamina and a division of normal tooth germ as well as environmental factors such as trauma, local infection and radiation, nutritional deficiencies [2,3]. Despite the presence of several articles in the literature reporting multiple degrees of malalignment, complete 180 degrees rotation of bilateral mandibular first molars are not reported up to our knowledge.

### **Aim of the Study**

The aim of present report is to describe a rare condition of rotation of 180 degree of bilateral mandibular first molars in pediatric patient with no history of trauma or any other dental anomaly in the oral cavity.

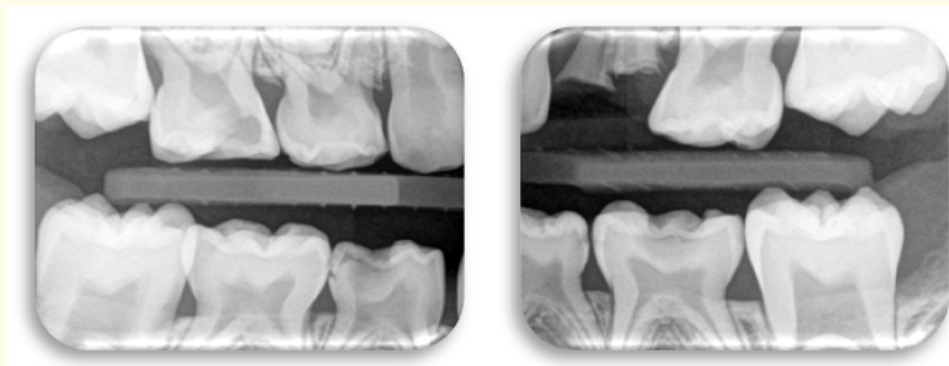
### Case Report

A 6 years old Saudi healthy male patient referred from primary health care to the pediatric dental clinics at King Saud Medical City, Riyadh, Saudi Arabia for comprehensive dental treatment. After clinical examination, it was observed that the patient had a bilateral rotated mandibular first molars in 180 degree with the lingual surface facing buccally (Figure 1).



**Figure 1:** Pre-operative photograph; lower occlusal view.

His medical, family and personal histories were taken and there was no sign of any systemic diseases or syndromes. The patient's father did not remember any incident of trauma to his child's face. The clinical examinations of his parents and sibling did not reveal any malformed teeth. According to the father there were no family members who presented with a similar condition. The rotated teeth were newly erupted and showed intact, without carious lesions, mobility or periodontal disease. The rest of the teeth were in proper occlusion and some of them having carious lesions. Radiographic examination for the mandibular first molars showed no abnormalities in pulp or periodontal ligaments (Figure 2).



**Figure 2:** Pre-operative radiographs; right and left bitewings view.

There was no need for treatment for the bilateral rotated mandibular first molars in 180 degree, since it consists of an individual dental change that did not influence the occlusion, did not cause deformation of the jaws, nor interfered with the patient's facial features. However, because the patient considered as high risk according to caries-risk assessment, pit and fissure sealants have been applied as preventive measures (Figure 3) [4].



*Figure 3: Six-months recall photograph; lower occlusal view.*

### Discussion

Reports in the literature of 180 degrees rotation can be found in the case of maxillary incisors and premolars as well as lower central incisors [5-8]. The exact etiology of tooth rotation is still not fully understood. It is rare to find a completely rotated tooth with no space between the teeth or malalignment of the adjacent teeth. In this case, the patient was unaware of his rotated tooth until this was demonstrated to him with the photographs.

There are several hypotheses about its origins in the literature, such as heredity, hyperactivity of the dental lamina, a division of normal tooth germ, activity of the remnants of dental lamina and Hertwig epithelial root sheath, lack of space for normal eruption, genetic mutations by interacting with environmental factors such as trauma, local infection and radiation, nutritional deficiencies [2]. In addition, an impairment in bone development of dental arches could lead to disturbances in the positioning of the teeth [3].

Another theory that provides a reasonable validation is the 'theory of axial gradients'. It proposes that the polarity of a cell is determined by its metabolic rate. So likewise, the polo with the highest metabolic rate develops into the 'head', while the other one develops into the 'tails'. Putting this concept into effect for tooth having a 180 degrees rotation, it can be derived that via some 'accidents of nature', perhaps during the development of the tooth germ, the lingual portion grows at a faster rate than the buccal portion leading to the lingual portion of the tooth germ having grown into a 'buccal' cusp causing the positional variation [9,10].

### Conclusion

Although recent findings have increased our knowledge on the mechanisms of tooth morphogenesis, the genetic or morphogenetic mechanisms that produce extreme rotations of teeth are still unknown. Furthermore, there is no obvious explanation for the restriction of an extreme rotation to isolated teeth or contralateral pairs. The present case report was expected to contribute to the community's knowledge base, with the hope that the description would stimulate discussions from the researchers.

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