Esthetic Correction of Rotated Maxillary Central Incisor by Conservative Approach

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ABSTRACT

Tooth rotation is a dental anomaly of position, in which there is a displacement of the tooth within the alveolar bone around its longitudinal axis. Although it is a common finding in the premolar–molar region, rotations of the maxillary centrals are extremely rare and such aberrations are multifactorial in their origin.

It is important to have a thorough understanding of such anatomical variation, which can cause occlusal and esthetic problems in patients, to alert the dental surgeons, so that they are well prepared to carry out esthetic and functional rehabilitation of the teeth involved. A successful management of 180° rotated maxillary left central incisor by conservative approach is described here.

Keywords: Conservative approach, Esthetic correction, Maxillary central incisor.

INTRODUCTION

Rotation of a tooth around an axis is a rare anomaly found in human dentition in maxillary central incisors.1,2 Tooth rotation is defined as observable mesiolingual or distolingual intra-alveolar displacement of the tooth around its longitudinal axis.3 A minor to moderate axial rotation has been noted in individuals, which is commonly caused by crowding in the arch. The etiology is multifactorial in origin. Both genetic and local factors seem to contribute to this positional anomaly. The rotation of permanent teeth can be divided into two groups based on etiologic factors3,4 (Table 1). In addition, mesiodens can cause ectopic eruption, displacement or rotation of the central incisor in 28 to 63% of cases, and labially displaced incisor in 83% of cases.4

Gupta et al classified the rotation into three groups – group I: <45°; group II: 45° to 90°; group III: >90°.

The most common rotated teeth are the mandibular second premolar, followed by mandibular first premolar and maxillary central incisor with the same prevalence. Females are more likely to show rotation in mandibular second premolar and maxillary central incisor than males. Common rotations are between 45° and 90°, followed by <45° of rotations and >90° categories.5 A more pronounced axial rotation of an individual tooth typically involves 90° to 180° rotations. There are only very few case reports on 180° rotations of the maxillary second premolars.6

The aim of this case report was to present a potentially convenient and conservative approach using composite resin restoration for esthetic correction of 180° rotated maxillary central incisor.

CASE REPORT

An Indian boy aged 22 years presented to the Department of Conservative Dentistry and Endodontics, Bharati Vidyapeeth Deemed University Dental College and Hospital, Sangli, India, for an esthetic makeover of an unusual appearing upper front tooth. The patient was concerned about his appearance (Fig. 1).

Table 1: Division of rotation of permanent teeth based on etiologic factors

<table>
<thead>
<tr>
<th>Rotations of teeth due to preeruptive disturbances</th>
<th>Rotations of teeth due to posteruptive disturbances</th>
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<td>1 Injury to premaxillary region in childhood</td>
<td>1 It can be habitual, local, mechanical, or environmental</td>
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<td>2 Presence of pathology like cyst, tumor, odontoma, supernumerary tooth (mesiodens)</td>
<td>(A) Local factors – excess space, crowding, and retained primary teeth</td>
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<td>3 Cleft lip and cleft palate</td>
<td>(B) Environmental factors – space availability for tooth alignment, path of tooth eruption, functional influences exerted by tongue and lips</td>
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<td>4 Hereditary</td>
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Note: This table categorizes the possible etiologic factors leading to tooth rotation.
Clinical examination revealed a maxillary left central incisor with an anatomical labial crown surface which was placed palatally and vice versa. The patient had no history of trauma. Detailed examination showed good facial symmetry and competent lips at rest. The tooth was firm and periodontal probing was within physiological limits. The tooth showed positive response to electric pulp testing (Digitest; Parkell). As the tooth was vital, and keeping in mind the financial and time constraints of the patient, a simple and more conservative esthetic correction using composite resin restoration was planned. The patient was briefed about the procedure and shade selection was done using the VITA shade guide.

Diagnostic casts of the upper and lower arch were prepared using rubber base impression (Fig. 2). Necessary tooth corrections were made on the preoperative cast (Figs 3A and B) and wax mock-up preparation was done (Fig. 4).

Intraoral marking on the tooth was done followed by tooth preparation keeping in view the mock-up preparation made on the diagnostic cast under rubber dam isolation (Figs 5A and B).

Acid etching was done using 37% phosphoric acid for 20 seconds followed by thorough rinsing and
drying. Bonding agent was applied and cured for 20 seconds. Composite resin restoration was done by incremental technique to achieve the desired esthetics (Figs 6A and B).

**DISCUSSION**

This case report deals with an unusual aspect of 180° rotation of the upper front tooth. The etiology of the rotation could not be identified as the patient did not have any orofacial deformities, which are the possible etiological factors for the presence of rotated teeth. Clinical examination of his parents and siblings did not reveal any malformed tooth.

Teeth rotation can occur unilaterally or bilaterally as a result of migration, is more influenced by physiological factors than genetic factors, and clinical examination is sufficient for diagnosis.

Treatment modalities for rotated tooth include orthodontic intervention, surgical derotation, and prosthodontic correction. Fixed orthodontics includes application of whip device, which helps in permanent derotation of rotated tooth. Rotations can also be corrected using removable orthodontic appliances like labial bow and palatal spring. However, potential risks like decalcification, loss of periodontal support, root resorption, relapse, anchorage control, and patient compliance for root completion should be kept in mind before initiating the treatment.

Although surgical derotation has been found to be successful provided the tooth is reimplanted in the first 5 minutes, certain disadvantages like psychologic trauma and damage to periodontal ligament leading to loss of tooth vitality have been noted.

The literature has also revealed prosthodontic intervention for correction of rotated tooth, but certain drawbacks like extensive tooth preparation leading to pulpal exposure with subsequent requirement for intentional root canal treatment, cost efficacy, and length of time required for completion of the procedure should be taken into account.

Hence, keeping in view the above-mentioned advantages and disadvantages of different techniques, the present case was treated by a simple and more conservative approach.
CONCLUSION

A 180° rotation of a tooth around an axis in the human dentition is a rare anomaly. Although various treatment modalities are available in treating such a perplexing condition, appropriate treatment plan with a timely intervention is a must for rehabilitation of such rare dental conditions. This case report describes a simple yet effective conservative management of 180° rotated maxillary central incisor.

REFERENCES