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## Management of Unerupted, Horizontally Impacted Maxillary Central Incisor by Forced Eruption Method: A Case Report



### Medical Science

**KEYWORDS :** impacted (horizontal), maxillary incisor, forced eruption.

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### ABSTRACT

*Ectopic eruption of permanent incisor is an unusual outcome of traumatic injury to their predecessors. In this case report, we describe the surgical-orthodontic management of the unerupted, horizontally impacted right maxillary permanent central incisor in a 10 year old boy.*

### INTRODUCTION:

Eruptive disturbances are changes in the normal tooth eruption which are clinically manifested as, accelerated, delayed, failed or deviation in the direction of tooth eruption, related to general or local etiologic factors. General factors refer to the presence of multiple compromised dental disturbances and are associated with particular disease or syndrome and are of rare occurrence<sup>1, 2</sup> Local factors involve a single tooth or adjacent teeth usually without systemic association and shows an asymmetric eruption of more than 6 months in relation to its homologue resulting in change of sequence as well as chronology of normal eruption.

Local factors related to eruption disturbances in the maxillary anterior region are of i.obstructive etiologic factors includes supernumerary tooth, negative tooth-bone discrepancy, gingival fibrosis, ankylosis, retained primary tooth, caries or premature loss of primary tooth resulting in space closure, tumor, supernumerary root, macrodontia, change in tooth eruptive sequence, cyst and odontoma; ii.genetic or developmental factors.<sup>5</sup>

### iii.traumatic factors 1, 2, 5-7

### iv.idiopathic factors. 1, 2

Ectopic, impacted incisors located parallel to the occlusal plane high in the vestibule, may result from traumatic injury to its predecessor. This condition is caused by the physical displacement of the permanent tooth germ as well as the lack of eruption guidance by the prematurely lost primary incisor or both.<sup>6</sup> The frequency of which ranges from 0.006% to 0.2%, and possess important problem in terms of esthetics and occlusion in the mixed dentition.

In this article, an 10 year old male with an unerupted, ectopically placed (parallel to the occlusal plane) maxillary permanent central incisor, was managed by forced eruption method using surgical and orthodontic treatment modalities.

### CASE REPORT:

A 10 year old male patient was reported with a complaint of delay in the eruption of his upper right central incisor. The

past medical history was un-remarkable but the dental history revealed, trauma to the upper right front tooth region, experiencing intrusion injury of the maxillary right primary central incisor and laceration injury to the soft tissues of the face, lip limited to the intruded tooth, while playing in a park at the age of 5 year. The child got his intruded tooth extracted a month later at a clinic near his place due to the extreme mobility of the intruded tooth after re-eruption.

The patient was in late mixed dentition and had an Angle's class-1 molar relationship. Tooth was bulging in the labial sulcus on intra oral clinical examination. (fig-1) The mesiodistal width of the crown of the erupted upper permanent left central incisor was 8mm and the space available for the unerupted right central incisor was found to be 8mm indicating, adequate space for the alignment of the tooth.

Intra oral periapical radiograph was taken to assess the position and morphology of unerupted upper right permanent central incisor (fig-2), which showed that the maxillary right central incisor was at a higher level than the contralateral tooth and the root was completely formed with apical closure. Clinical and radiologic examination dictated the correct position of the horizontally impacted tooth in the vestibular sulcus under the labial frenum.

The forced eruption of the unerupted, horizontally impacted tooth by surgical and orthodontic method was opted as the treatment modality in the present case. The parents were informed about the possible risks of the treatment and consent was obtained before the procedure. Tooth was surgically exposed to bond a bracket on the labial surface for forced eruption technique with 0.018x0.025 preadjusted edgewise appliance (fig-3), (fig-4).

The orthodontic traction was applied to unerupted maxillary right central incisor through a ligature wire. As the tooth moved gradually downward, the ligature wire was tightened to exert orthodontic force to move the tooth further downward till the tooth was positioned at the same level, compared with the adjacent erupted left central incisor. Erupted crown was found to

be horizontally positioned with the palatally inclined root upon clinical (fig-5,6) and radiological examination.

To torque the root labially, transpalatal arch with a hook was fabricated and soldered to the molar bands. Begg bracket was bonded on to the palatal aspect of maxillary right central incisor and was connected to the hook of the transpalatal arch with an elastic chain(fig-7).

T.P.A appliance offered good anchorage and prevented the forward movement of the permanent first molars during correction of the root torque and resulted in precise movement of the root labially.

Hyperplastic tissue on the labial frenum during the eruption phase of the tooth, was managed by the frenectomy procedure. The gingival contour and the attached gingiva was restored to an acceptable and healthy contour after the frenectomy procedure. The hyperplastic tissue revealed an inflammatory hyperplasia on histopathological investigation. In order to achieve the final alignment with reference to the labio-palatal positioning, 0.016 Ni-Ti wire was used followed by a 0.017x0.025 steel arch wire. The unerupted, impacted tooth was restored to the proper position with ideal overbite and overjet over a period of 18 months (fig-8). Retention appliance was given for 6 months after the removal of the bands and brackets. Post- treatment, the boy showed normal crown length and esthetically pleasing gingival contour.

**DISCUSSION:**

Unerupted, impacted permanent tooth with crown positioned parallel to the occlusal plane caused as a result of traumatic luxation injury to the primary incisor are not only uncommon in routine clinical course but also have serious consequences on aesthetic, phonetic, occlusal and psychologic problems for young patient. Management option for such teeth includes i.surgical extraction and moving the lateral incisor to mimic the central incisor and changing the anatomy of the other teeth. ii.surgical repositioning,iii.orthodontic correction. Ifthe impacted tooth is chosen for extraction, it results in compromised alveolar bone resulting in thinner and deficient bone following post extraction period and hence should be considered for impacted tooth with poor treatment option. The option of implant placement following extraction usually demandscomplete growth of the respective jaws for good results. Surgical repositioning as a treatment option can result in devitalisation of tooth, replacement resorption and added trauma for theyoung child.

Few reports have been published inthe management of unerupted,impacted tooth withhorizontally positioned crown but clinical and radiological variance will be there with respectto the age, position, angulation of the crown-root and various other factors, which will have the impact on the selection of the various treatment options. Even though complex, forced eruption method employing surgical and orthodontic means using light tractionforce was evaluated as the viable treatment option in this case<sup>10</sup>and resulted in this treatment option is well accepted and the child retains the natural tooth in the arch.

The forced eruption technique is performed by a button or a bracket attached to the teeth either labially or palatally after the crown is surgically exposed. The force of 50 gm is applied either by an elastomeric chain, an elastic thread or ligature wire tied between the bracket and the arch wire.<sup>10</sup>In some cases, closed eruption surgical technique is applied and the flap is returned to its original location after placing the attachments on the impacted tooth,<sup>10</sup>while in others the tooth is surgically exposed with an apically positioned flap 9 or a “U” shaped flap.<sup>10</sup>

The present case report reveals thesuccessful management of an

impacted, horizontally oriented crown ofmaxillary central with complete root development, diagnosed in the late mixed dentition phase. Although forced eruption method of the impacted tooth was a clinical challenge, it proved as the best treatment option.

**Figure legend**



(fig-1) - Preoperative photograph



(fig-2) - Preoperative radiograph



**(Fig-3)- Surgically exposed unerupted tooth with horizontally positioned crown****(Fig-4)-Bonded bracket on the labial surface****(fig-5,6)-Labially positioned incisor****(fig-7)-Transpalatal arch with engaged elastic chain****(fig-8)-Post treatment photograph.**

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