

Orthodontic Management of Ectopically Erupting Central Incisor: A Conservative Approach

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Abstract

Multiple treatment modalities are available for patients with ectopically erupting central incisor. Conservative management of this cases is important to prevent the adverse effect on psychology of patient and normal development of dentition. This paper shows a case with a conservative orthodontic approach in 10-year-old male child presented with ectopically erupting left central incisor. The orthodontic treatment plan included two steps – creation of space and forced eruption. A unique technique for orthodontic traction (0.017 × 0.025 SS wire with incisal extension) was employed to move the maxillary incisor into arch, with minimum injury to neighboring soft tissue.

Keywords: ectopic eruption, orthodontic traction

Introduction

Eruption disturbances related to the position include ectopic eruption and transpositions. The occurrence of ectopic eruption is most commonly associated with maxillary incisors. The normal eruption, position and

morphology of these teeth are crucial to craniofacial development, facial esthetics as well as phonetics. It is essential that the clinicians have thorough knowledge of the eruption disturbances in order to make an appropriate, as well as timely intervention, as dictated by the complexity of the problem.

Maxillary anterior teeth are very important to facial esthetics, often referred to as the ‘social six’, as they are on maximum display during speech and smile in most individuals. Ectopic eruption refers to the eruption of a tooth in a position that is not its normal position in the dental arch.¹ The prevalence of ectopic eruption is 5.6% and majority of these are permanent central incisors; while maxillary incisors can erupt ectopically or be impacted from supernumerary teeth in up to 2% of the population.^{2,3} Ectopic eruption is considered as a rare developmental anomaly of unknown and controversial etiology. Several theories have been attempted to explain the cause for ectopic eruption. However, the multifactorial process of

the growth and development makes it difficult to identify specific primary etiological factors responsible for it.¹

According to Sweet, in 1939, it was related to evolutionary changes which resulted in gradual reduction in the number of permanent teeth of the human dentition. O'Meara stated that insufficient intercanine and anteroposterior growth of the jaws contribute the most.⁴ Niki-foruk and others also share the view of lack of regional bone growth. Several authors have also considered genetic factor to have influence on it.

Following local factors can be probable reasons for ectopic eruption of maxillary incisors:

- Supernumeraries
- Retained deciduous teeth
- Traumatic injury to the primary teeth
- Tooth size arch length discrepancy
- Congenital/developmental disturbance, e.g. cleft of palate, single tooth macrodontia.⁵

Once a tooth (or teeth) is noticed to be 'ectopically' erupting, interceptive orthodontics should be carried out in order to reduce the severity of the developing malocclusion and the management depends on the etiology, position, patient's esthetic concern and accommodability of the tooth into an acceptable position within the arch.

Treatment options include

- Observation for spontaneous correction after removal of the etiological agent.⁶
- Orthodontic intervention by means of either removable or fixed appliance in cases where the ectopically erupted incisors need assistance to be brought into correct position.

Interceptive procedures should be undertaken as soon as sufficient permanent teeth have erupted, as well as co-operation from the child to accept the various steps of the procedure.³

History and diagnosis

A 10-year old male patient was referred to the Department of Orthodontics from Department of Pedodontics, Loni. Patient reported to us with ectopically erupting Left Central Incisor. A modified Hawley's plate with Transverse Palatal Bars was present. Past dental History of surgically exposed left Central Incisor and a window was created by drilling the tooth at the junction of middle and incisal third. A thick ligature wire was passed from the drilled hole of Central Incisor and attached to the transverse bar of Hawley's plate with elastomeric chain for extrusion of incisor (Fig 1).



Fig . 1: Pretreatment intra oral records

Treatment objectives

1. Create the space for impacted central incisor
2. Orthodontic traction of impacted tooth

Treatment progress

The 0.022 × 0.028 MBT bracket was bonded on the maxillary right central incisor and maxillary left lateral incisor. The initial alignment was performed with a 0.016-inch Ni-Ti wire, followed by a 0.016×0.028 , 0.017×0.028 Ni-Ti and 0.017×0.028 stainless steel wire. After the initial alignment, open coil spring was placed on 0.017×0.028 stainless steel wire in between upper right central incisor and upper left lateral incisor for space creation (fig 2:A). After the sufficient space creation,

lingual button was bonded on left central incisor. For extrusion of central incisor and to maintain the created space, modified wire framework with 0.017×0.028 SS with incisal extension was fabricated. A force of approximately 50 g was applied by an elastomeric chain to the central incisor (Fig 2:B) . After complete eruption of central incisor, Hawley’s retention plate was given to the patient.



Fig. 2: Mid treatment: A: 0.017×0.028 SS wire with open coilspring for space creation. B: Modified wire frame work with 0.017×0.028 SS wire with incisal extension and lingal button bonded to left central incisor, elastomeric chain placed from lingual button to the incisal wire extension

Results

After 9 months of active treatment, ectopically erupting left central incisor was successfully brought into the arch. The repositioned incisor had slightly irregular gingival contour.



Fig. 3: Post treatment

Discussion

The variation in the normal eruption pattern of the central incisor is common. Due to the location of the maxillary incisors, usually prompt the parent to seek treatment to prevent psychological ramifications that accompany abnormalities of the anterior maxilla. To properly treat these individuals, the clinician must have knowledge of the etiology, classification and timely intervention treatment modalities in managing the ectopic eruption of the maxillary incisors.

Ectopic eruption of permanent incisors can be suspected commonly after trauma to primary incisors, with pulpally-treated primary incisors, retained deciduous teeth, asymmetric eruption and presence of supernumerary tooth.⁷⁻⁹

Some ectopically erupted permanent incisors can spontaneously get corrected after removal of the etiological agent, but others persist or even deteriorate.¹⁰

The successful management of the ectopically erupted central incisor is often a difficult task and enquires the joint expertise. It is important that orthodontist and pedodontist together prepare a full proof treatment plan based on scientific rationale. In the present case, the patient was reported to us with ectopically erupted left central incisor. The modified Hawley’s plate and the ligature wire was moved for further treatment. As the patient was in his early mixed dentition period and high caries index, a conservative approach was preferred for the aligning the incisor. A modified wire frame work was fabricated with 0.017×0.028 SS with the incisal extension for the attachment of elastomeric chain. This wire framework serves both the purpose, maintaining the gained space and attachment for elastomeric chain.

Conclusions

The treatment of ectopically erupting maxillary incisors fulfilled the predictable objectives of interceptive

treatment by preventing the existing problems from worsening, providing a more favorable environment for normal growth and improving facial esthetics for more normal psychosocial development.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

References

1. Mattos BSC, Carvalho JCM, Matusita M, Pinhiero Alves APP. Tooth transposition literature review and a clinical case. *Braz J Oral Sci.* 2006;5(16):953–957.
2. Doruk C, Babacan H, Bicakci A. Correction of a mandibular lateral incisor-canine transposition. *Am J Orthod Dentofacial Orthoped.* 2006;129(1):65–72.
3. Shapira Y, Kuftinec MM. Infrabony migration of impacted teeth. *Angle Orthod.* 2003;73(6):738–743.
4. Nikiforuk G. Ectopic eruption: Discussion and clinical report. *J Ont Dent Assoc.* 1948;25:243–246.
5. Yaseen SM, Naik S, Uloopi KS. Ectopic Eruption: a review and case report. *Contemp Clin Dent.* 2011;2(1):3–7.
6. Barberia-Leache E, Suarez-Clua MC, Saavedra-Ontiveros D. Ectopic eruption of the maxillary first permanent molar: characteristics and occurrence in growing children. *Angle Orthod.* 2005;75(4):610–615.
7. Brin I, Ben-Bassat Y, Zilberman Y, Fuks A. Effect of trauma to the primary incisors on the alignment of their permanent successors in Israelis. *Community Dent Oral Epidemiol.* 1988;16(2):104–108.
8. Coll JA, Sadrian R. Predicting pulpectomy success and its relationship to exfoliation and succedaneous dentition. *Pediatr Dent.* 1996;18(1):57–63.]
9. Taylor GS. Characteristics of supernumerary teeth in the primary and permanent dentition. *Dent Pract Dent Rec.* 1972;22(5):203–208.
10. Russell KA, Folwarczna MA. Mesiodens—Diagnosis and management of a common supernumerary tooth. *J Can Dent Assoc.* 2003;69(6):362–326.