

Orthodontic Management Of Transposition And Ectopic maxillary Canine - A Case Report

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Abstract

Introduction: The eruption path of the maxillary permanent canine is not only long and winding, but slightly buccal in relation to the dental arch. Moreover, its eruption occurs after that of the lateral incisor and the first premolar. Therefore, any approximation between the roots of these teeth decreases the space available for the canine and may cause their intraosseous retention or ectopic eruption, usually manifested by an exaggerated buccal position. **Objective:** the aim of this case report was to present the treatment of transposition and ectopic maxillary **Case Report:** A 15 years-old boy with chief complaint of misaligned teeth. Clinical examination revealed a convex facial profile with a unproportional lower third of the face, diminished nasolabial angle, showed canine displaced while smiling. The presence of the right and left maxillary primary canine was noted, as well as space deficiency in the maxillary arch of approximately —18 mm and severe crowding both of the anterior teeth in maxilla and mandible. Furthermore, the maxillary canines presented virtually superimposed buccal to the maxillary lateral incisors or nearly transposed. The patient was treated with 0.022-in Roth prescription brackets. Extraction of the 14, 24, 35, and 45 to reveal the crowding and corection the transposition and ectopic maxillary canine. Total treatment time was 15 months. On the day of debonding, a maxillary Hawley retainer was delivered **Conclusion:** Proper treatment of an ectopic canine patient with severe crowding requires careful treatment planning by the orthodontist. The decision to extract the premolars is to be good aesthetically, functionally, and for more stable results in these patients

Keywords: ectopic eruption, maxillary canines, orthodontic treatment

INTRODUCTION

Canines are the second most frequent cases of teeth displacement and impaction among all teeth, following third molar impactions. Regarding the functional aspects, canines are equally important for supporting the overall dentition and for contributing to posterior disocclusion during lateral excursions.¹

Buccally ectopic canine eruption occasionally occurs in spite of adequate space in the dental arch. This condition has been defined as “primary tooth germ displacement,” meaning that the tooth

develops in an aberrant site or with an unusual orientation, presumably due to an abnormal genetic pattern. No specific dental features of the dentition have been associated with these canines.^{2,3}

Eruption disorders associated with transposition occur in the maxilla in 76% of cases, predominantly involve canines (90%), premolars (71%), or lateral incisors (20%), and defy early diagnosis owing to their multifactorial character. The prevalence of permanent maxillary canine impaction or ectopic eruption in the general population is approximately 1-2%.^{3,4}

The eruption path of the maxillary permanent canine is not only long and winding, but slightly buccal in relation to the dental arch. Moreover, its eruption occurs after that of the lateral incisor and the first premolar. Therefore, any approximation between the roots of these teeth decreases the space available for the canine and may cause their intraosseous retention or ectopic eruption, usually manifested by an exaggerated buccal position.⁵

There are many different approaches to treating impacted maxillary canines, but most of them do not provide biomechanical control or the ability to vary the force vector in response to changes in the canine's spatial position.* Diagnosis of permanent canine eruption irregularities begins with clinical observations of the patient.

DIAGNOSIS AND ETIOLOGY

A 15-year old boy presented for clinical care at the RSGM Unhas, with the chief complaint of misaligned teeth. According to her medical history she was in overall good health. The clinical examination revealed a convex facial profile with a unproportional lower third of the face, diminished nasolabial angle, showed canine displaced while smiling (Fig1). The mandibular closure pattern showed no deviation and neither did the temporomandibular dysfunction.

The presence of the right and left maxillary primary canine was noted, as well as space deficiency in the maxillary arch of approximately —18 mm and severe crowding both of the anterior teeth in maxilla and mandible. Furthermore, the maxillary canines presented virtually superimposed buccal to the maxillary lateral incisors or nearly transposed.

The mandibular arch presented with moderate crowding of the anterior teeth with a space deficiency of approximately —12,5 mm. When in occlusion, the maxillary laterals showed linguoversion of 35 and 45, which in addition to an overbite 2 mm and an overjet of 2,5 mm. The upper dental

midline deviated 1 mm to the right and lower dental midlines coincided with each other and with the face, and a Class I molar relationship was present.

Radiographic examination showed all third molars was impacted. Cephalometric radiograph and analysis (Table 1) demonstrated a skeletal class III (ANB angle -3° , wits appraisal - 4mm). The SNA angle of 75° indicated an retrognathic maxilla compared with cranial base, and the SNB angle of 78° reflected retrognathic mandible compared with cranial base.

TREATMENT PROGRESS

Straight wire appliance, Roth prescription brackets with 0.022-in slots were placed on all teeth in both arches, with bands on the maxillary and mandibular first and second molars. For leveling and alignment of the maxillary arches, a round 0.012-in nickel-titanium archwire was engaged. Following extraction of the 14 and 24 and placement bracket of 13 and 23. One month later, a 0.014-in nickel-titanium archwire was engaged with laceback, chinc back, and low retraction 13, 23 with powerchain. Alignment of the canine greatly improved as the wire progressed (0.014-in nickel-titanium and 0.018-in stainless steel). After the labially placed canines were corrected and a good occlusal relationship was attained, detailing and finishing were undertaken.

Leveling and alignment of the mandibular arches start with 0.014-in nickel-titanium archwire was engaged. After 2 month, a 0.016-in nickel-titanium archwire was engaged with chinc-back and following 0.018-in stainless steel. Finishing and occlusal adjustment were undertaken after good occlusal relationship. Total treatment time was 15 months. On the day of debonding, a maxillary Hawley retainer was delivered.



Fig 1. Pre-treatment facial and intra-oral photograph

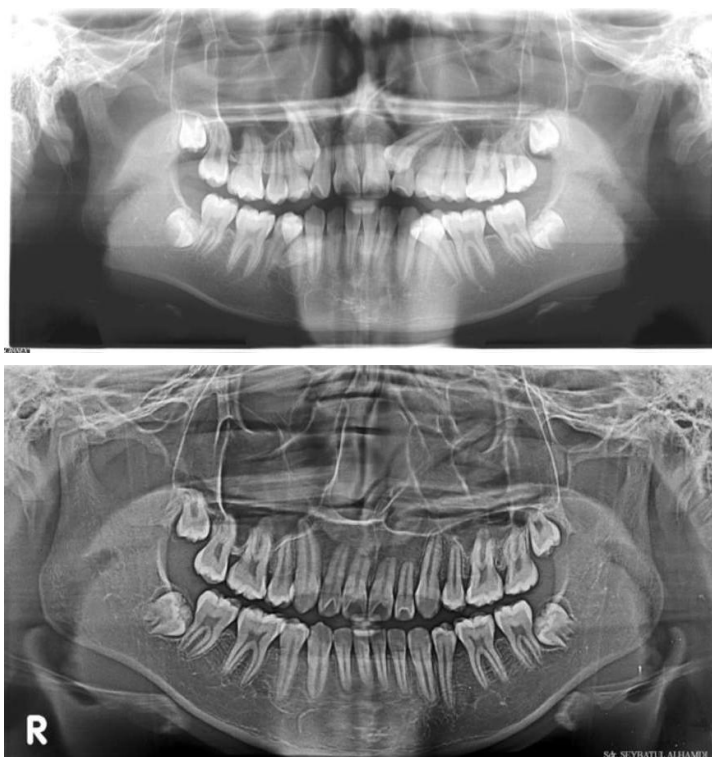


Fig 2. Panoramic radiograph before and after treatment



Fig 3. Post-treatment facial and intra-oral photograph



Fig 4. Cephalometric radiograph and superimposition before and after treatment

Table 1. Cephalometric analysis pre and post treatment

Horizontal skeletal			
<i>Parameter</i>	<i>Norm (mean ± SD)</i>	<i>Pre</i>	<i>Post</i>
SNA (°)	82±2	75	75
SNB (°)	80±2	78	79
ANB (°)	2±2	-3	3
Wits appraisal (mm)	1±1	-4	3.5
Convexity (°)	0±5	90	8
Dental Analysis		102	101
Interincisal Angle(°)	135±10	117	110
Soft Tissue Analysis			
E-Line upper lip (mm)	2-3	2	-1
E-Line lower lip (mm)	1-2	1	-0.5

DISCUSSION

Among the main goals of an orthodontic treatment are enhancing facial and smile aesthetics, as well as improving masticatory function. In order to achieve these goals, it is definitely desirable, although not always possible, to have teeth being aligned according to a natural sequence.⁷

Ectopic canines are believed to occur with a wide variety of systemic and local etiologies. No single etiology has been shown to explain the occurrence of a majority of ectopic eruptions or to allow differential explanation of those occurring either labially or palatally. Environmental factors may contribute to this anomaly during the long, tortuous eruption path of a canine. Another possible explanation is that a disturbance associated with the follicle of the unerupted tooth may influence the direction of eruption and contribute to the displacement of the maxillary canine.^{3,8}

Ectopic buccally erupted maxillary canines are one of the most frequently encountered conditions in orthodontic practice.⁹

In the present case, a transposition was revealed by intra oral and radiography examination, which was characterized by crown of the maxillary canine, positioned mesial in relation to the lateral incisor (in

left side) and with a root apex located distal to the lateral incisor.

Esthetically and functionally, it is recommended in these cases that the transposed teeth be moved to their normal position in the dental arch. Tooth movement should be performed preferably in the center of the alveolar ridge and in areas where the band of attached gingiva is at its largest.

Moss JP insist on careful examination of space analysis, the morphology of the adjacent teeth, contours of the bone, mobility of the teeth, radiographic examination.¹⁰

The amount of space in the dental arch for an unerupted canine can be assessed by performing a space analysis with a full set of orthodontic records. Space for the unerupted canine can be gained by expansion of the maxillary arch, proclination of maxillary incisors, or extraction of the permanent premolars. It should be emphasized that a proper biomechanical control combined with the need to create spaces for tooth movement (which includes the need for extractions), are some of the essentials of orthodontic practice.¹¹

CONCLUSIONS

The successful treatment of a patient with an ectopic tooth and severe crowding can be a challenging task for an orthodontist. Proper treatment of an ectopic canine patient with severe crowding requires careful treatment planning by the orthodontist. The decision to extract the premolars is to be good aesthetically, functionally, and for more stable results in these patients. In light of the attention currently being paid to aesthetics as a primary treatment goal for both practitioner and patient, today's treatment plans for patients with ectopic canine must consider more than the orthodontic outcome.

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