

A Fail Safe Approach to the Management of Ectopic Canines: A Case Report

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ABSTRACT

Background: Ectopic eruption of maxillary canine is a commonly encountered problem in Orthodontic practice. Two methods have been developed for canine retraction sliding mechanics and loop mechanics. In the case being presented a 20-year-old boy with an ectopically erupted left maxillary canine and retained deciduous canine and second molar on the same side with a 90-degree rotation of the upper left central incisor was aligned with a segmented t loop retraction spring which delivered a light continuous force on the left canine and a couple force for the de-rotation of the central incisor in combination with a palatal nance button to reinforce the anchor unit and a bypass arch wire. The results were stable both functionally and esthetically and to ensure satisfactory post treatment alignment of the maxillary and mandibular anterior dentition, the continued use of fixed retainers was recommended indefinitely.

Keywords: Ectopic canine, segmented T loop retraction spring, Rotated central incisor, Bypass arch wire.

INTRODUCTION

Maxillary canines are known as the corner stones of the mouth. They are considered to be important for esthetics and for functional occlusion¹. Any disturbance in the eruption process leading to an aberrant position will hamper esthetics as well as function. Such conditions can be treated orthodontically in various ways including the alignment of canine into proper arch. This case report describes the leveling and alignment of a highly placed canine into proper occlusion with a sectional approach to maxillary canines using a segmental T loop retraction spring and a Nance palatal arch to reinforce the anchorage unit.

History, clinical findings and diagnosis

Our patient was a 20 year old boy who exhibited an orthognathic profile; his intraoral

findings revealed an ectopically erupted left maxillary canine with retained deciduous canine and second molar on the same side and a 90 degree rotation of the upper left central incisor. The lower arch was relatively well aligned with a congenitally missing central incisor. Angles classification showed a good class 1 molar relation and class 1 canine relation on the right side A normal overjet and overbite were also recorded (Fig.1). Cephalometric evaluation disclosed a Class I skeletal relationship with an average mandibular plane angle and a normodivergent growth pattern. The maxillary and mandibular incisor inclinations were also within normal limits. The treatment objectives were to bring the canine to its proper alignment and position, and to achieve Class I canine relation along with the derotation of 21. To create space and facilitate canine retraction, removal of the maxillary left deciduous canine was the first procedure

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Fig 1: Intraoral Pre-treatment Photographs.



Fig 2: T loop with pre activation bends.



Fig 3: After canine retraction.



Fig 4: Sectional alignment of the upper arch with 018 NiTi.



Fig 5: Bypass arch wire.

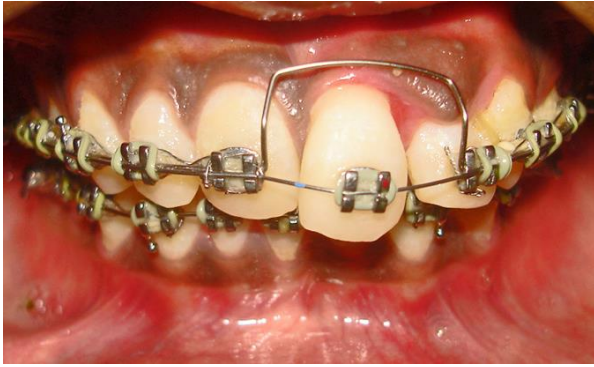


Fig 6: Bypass arch wire with over lay NiTi for true intrusion.



Fig 7: Residual space closure with 018SS.



Fig 8: Stabilization with 021 x 025 SS.



Fig 9: Intraoral post treatment photographs.

undertaken followed by proximal stripping of the retained deciduous second molar.

TREATMENT

A .022 x .028 inch pre adjusted edge wise appliance with MBT brackets (3M Unitek, Monrovia, CA, USA) was bonded and banded on the left maxillary canine, first premolar and molar. A segmented T loop levelling wire fabricated using a .017 x .025 inch TMA wire(ORMCO, CORP, GLINDORA, CALIFORNIA) with preactivation bends was then employed with the ectopic canine and accessory tube of the first molar and the segment was stabilized with 019 x 025 inch stainless steel wire, entering in to the main arch wire slot of the buccal tube² (Fig.2). The T loop was reactivated every 3 to 4 weeks by active tying back until a 2mm displacement between the two legs was achieved on each appointment. As the retraction progressed

canine moved to a more favourable anterior posterior position within a period of 6 months (Fig.3). 0.022 MBT brackets were then bonded on the remaining maxillary and mandibular teeth excluding 21. Alignment of the canine and maxillary and mandibular dentition greatly improved as the wire progressed from sectional 0.014 NiTi to 0.018 nickel-titanium (Fig.4). After the levelling and alignment of other maxillary teeth except 21, a rigid 0.020" stainless steel premium plus (A.J Willcock) bypass arch wire was inserted in to the maxillary arch, the strategy was to derotate 21(Fig.5). Lingual buttons were then bonded on the labial and palatal surface of 21 and couple force was applied with a modified rotation tie using elastic module and steel ligature to derotate it. This applies light and continuous force over a period of time and brings effective tooth movement.³ Patient was recalled every fortnightly for activation. In this case, couple was used to derotate the affected central incisor after levelling and alignment of adjacent teeth so that a rigid arch wire would preserve the arch form. Nine months in to treatment after derotation of 21 it was noticed to be extruded in relation to the remaining maxillary anterior teeth. In order to achieve a true intrusion an overlay continuous 0.14 NiTi wire followed by 0.16 and 0.18 NiTi was engaged in all the bracket slots (Fig.6). After the complete alignment of the upper arch round 018 inch stainless wire premium plus (A.J Willcock) was engaged, the strategy was to close the remaining residual space noticed in the anterior region using continuous elastic chain (Fig.7). Alignment of the maxillary and mandibular dentition continued to progress through a series of wire sequence from 0.17 x 0.25 to 0.21 x 0.25 NiTi and stainless steel wires that resulted in a good arch coordination. Torque on the maxillary left canine got corrected gradually as the wire progressed in the upper arch to a 0.21 x 0.25-inch stainless steel arch wire. No additional torque was placed on the maxillary left canine (Fig.8). Fixed lingual retainer with 'flexible spiral wire' was bonded to retain the achieved result after active treatment duration of 18 months. To ensure continued satisfactory post treatment alignment of the maxillary and mandibular anterior dentition, the continued use of fixed retainers was recommended indefinitely. The patient was satisfied with his teeth and profile (Fig.9). Good intercuspation, interproximal contacts, and satisfactory root parallelism were achieved and the

results were stable both functionally and esthetically,

DISCUSSION

In orthodontic practice, it is common to have patients with ectopic eruption of canine, in which buccally erupted canines are mostly encountered. Most of the cases are treated with NiTi flexible wire engaged in rotated and highly placed canine during the leveling and alignment stage.⁴ Flexibility of the NiTi wire pulls the canine in proper level and alignment with the anchorage from the adjacent tooth; in which lateral incisors and premolars are usually the anchor teeth. However, during the process of alignment of buccally placed canine, there is some intrusion of the anchorage unit satisfying the Newton's third law of motion³ finally leaving with a distorted occlusal plane. In contrary, the retrieval of rotated and highly placed canine with loop mechanics in a stainless steel wire resulted in a minimal chance of distortion of the occlusal plane. The loop creates a break in continuity of arch wire resulting in minimal side effect to the anchorage unit. The stainless steel loop wire provides flexibility without compromising the strength of the wire providing stability to the anchorage unit. As a result, there is minimal distortion to the occlusal plane.⁵ The multi-loop (e.g. box loop, L-loop, T-loop etc) has horizontal and vertical bends which bring rotated highly placed canine to its position with less treatment time and minimal side effect to the anchorage unit.

CONCLUSION

The results of the present case showed a considerably good control over the ectopic canine with no gingival recession and anchorage loss. An additional benefit is that the force system is predictable with frictionless springs and not dependent upon sliding teeth along the arch wire for control⁵.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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