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## Case Report

# An easy way to treat buccal canine malocclusion: A case report

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### ABSTRACT

An ectopic tooth is one that is erupting in an aberrant route, whereas an impacted tooth is one that has failed to fully erupt into the oral cavity within its expected developmental time period and can no longer be expected to do so. The majority of canine eruption abnormalities occur in one of two directions: palatal or buccal displacement from the usual eruptive location. Permanent maxillary canine impaction or ectopic eruption affects about 1-2 percent of the general population. Canines that are palatally displaced are twice as common as those that are buccally placed. Buccally displaced canines, on the other hand, are very prevalent in practice and their etiology is related to a deficient dental arch perimeter. So, the purpose of this report is to show a case of a 15-year-old male with ectopic maxillary canines who was treated by extracting the four first premolars, using segmental T loops for retraction of ectopic canines. The goals were met at the end of treatment with optimal aesthetic balance and excellent occlusal connections, resulting in great long-term stability.

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## 1. Introduction

An ectopic tooth is one that is erupting in an aberrant route, whereas an impacted tooth is one that has failed to fully erupt into the oral cavity within its expected developmental time period and can no longer be expected to do so. The maxillary canine is located above the deciduous canine and is angulated medially, with its crown distal and buccal to the lateral incisor. The crown of the canine travels mesially until it reaches the distal aspect of the lateral incisor root. The erupting canine is led by the lateral incisor root and gradually uprighted to a more vertical direction until it is fully erupted. The majority of canine eruption abnormalities occur in one of two directions: palatal or buccal displacement from the usual eruptive location. Permanent maxillary canine impaction or ectopic eruption affects about 1-2 percent of the general population.

Canines that are palatally displaced are twice as common as those that are buccally placed. Buccally displaced canines, on the other hand, are very prevalent in practice and their etiology is related to a deficient dental arch perimeter.

So, the purpose of this report is to show a case of a 15-year-old male with ectopic maxillary canines who was treated by extracting the four first premolars, using segmental T loops for retraction of ectopic canines. The goals were met at the end of treatment with optimal aesthetic balance and excellent occlusal connections, resulting in great long-term stability.<sup>1-5</sup>

## 2. Case Report

A 15 years old male who came to the Department of Orthodontics And Dentofacial Orthopedics post graduate clinic with a chief complain of “Irregularly placed upper and lower front teeth”. His family, medical and dental history were non-contributory.

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On extra oral examination, the profile view showed a convex profile, obtuse nasolabial angle, and almost deep labiomental fold. The frontal view showed apparently symmetrical mesoprosopic face type, increased lower facial third, and regular nose size. The patient had incompetent lips with short upper lip length and morphology, and 4.2 mm incisal show at rest. Upon smiling, the patient had a non-consonant smile with full incisor crown length show with uneven gingival display and lip line. The patient had no occlusal cant. He had a short lip length and morphology; the upper dental midline was shifted 2 mm to the right with skeletal midline.

Intraorally, the patient had good oral hygiene with the ectopically erupted upper right canine (UR3). He had a full set of permanent teeth erupted in his mouth except for third molar in all quadrants. The patient had an angle class I molar relationship on right side and end on molar relation on left side. He had end on canine relationship on the left side and undetermined canine classification on the right side because of buccally displaced canine. He had moderate crowding in the upper and lower arch.

Furthermore, he had 2 mm overjet and 40% bite, ectopic, and buccally positioned UR3. The upper midline was 2 mm shifted to the right to the upper midline [Figure 1]. The arch forms of upper and lower casts were U shaped. Arch perimeter and Carey's space analysis indicated that there were moderate crowding of 9 mm and 8.5 mm in the upper and lower arch respectively. Bolton analysis revealed 2.6 mm overall maxillary excess (88.9%), including 0.03 mm of anterior maxillary excess (77.1%) [Figures 2 and 5].

The panoramic radiograph showed that condyles and ramie were relatively symmetrical. Teeth morphology, bone level, temporomandibular joint, and maxillary sinus were normal, and there were no bony pathologies and showed third molar buds in all quadrants [Figure 3].

The patient cephalometric X-ray showed that the cervical vertebral maturation was in stage 4. The analysis of lateral cephalometric X-ray and its tracing [Figure 4] showed that the patient had a skeletal class II relationship ( $SNA = 85^\circ$ ,  $SNB = 80^\circ$ ,  $ANB = 5^\circ$ ) that was confirmed by Wits appraisal (3.5 mm). He had a normodivergent growth pattern, and a relatively increased lower face height (56%). According to the angular and linear measurements, he had protruded lower incisors, (lower incisors to Nasion-B point [L1-NB] = 9.5 mm), (lower incisors to A- Pogonion [L1-Apo] = 6 mm). Furthermore, he had a normal nasolabial angle and protruded upper and lower lip (upper and Lower lip to Ricketts E plane were 1.2 and 3.5 mm respectively).

### 2.1. Treatment objectives

The treatment objectives were to: (1) Improve facial profile; (2) eliminate upper and lower crowding and create space for right maxillary canine; (3) Maintain Class I molar relationship on right side and establish class I molar and



Fig. 1: Extra oral photographs



Fig. 2: Intra-oral photographs

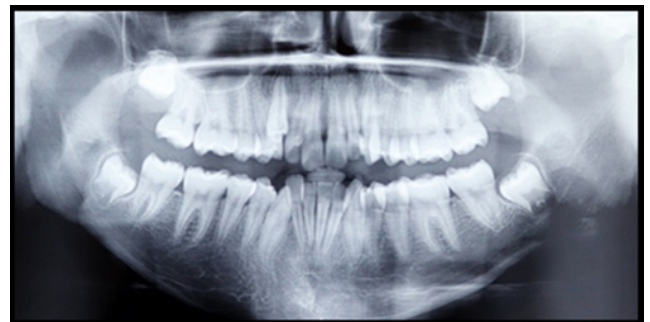


Fig. 3: OPG



Fig. 4: Lateral cephalogram



Fig. 5: Pre-treatment study models



Fig. 6: Intraoral photographs mid-treatment (segmental T-loop)

canine relationship of remaining sides. (4) Correct the shifted dental midline; (5) Maintain overjet and overbite; (6) Obtain functional occlusion with stable occlusal contacts in centric relation and during protrusion and laterality movements, and (7) Ensure stability results.

## 2.2. Treatment planning

Fixed orthodontic appliance with extractions of teeth right maxillary first premolar (14), left maxillary first premolar (24), left mandibular first premolar (34), right mandibular first premolar (44). For anchorage preparation, a nance palatal arch planned for the upper arch. Canines were retracted with segmental T- loop in first quadrant and with active tie back in 2<sup>nd</sup> quadrant respectively. En mass retraction was done in lower arch with loop mechanics. For retention, upper wrap-around removable retainer and lower lingual fixed retainer were delivered to the patient.

## 2.3. Treatment progress

Nance palatal arch cemented on the upper first molars as an aid to the anchorage.<sup>5</sup> Referral of the patient to the dental surgeon for the extraction of the selected teeth. Fixed orthodontic mechanotherapy with preadjusted edgewise (MBT-022X028" slot) appliance was used, using T-loop segmental arch mechanics in the upper arch. To shorten the duration of the treatment continuous archwire was placed in the maxillary arch bypassing the maxillary right canine,

alignment and leveling in both arches were accomplished with the following sequence of arch wires:

1. 0.016 × 0.022" heat-activated nickel titanium archwires
2. 0.017 × 0.025" stainless steel archwires
3. 0.019 × 0.025" stainless steel archwires.

The T-loop made up of 0.017 × 0.025" titanium molybdenum alloy (TMA) was attached to the maxillary right canine. T-loop was employed at the bracket of ectopic canine and accessory molar tube [Figure 6]. It was activated by 3 mm at subsequent appointments. The activation was done by pulling the distal arm and cinching it distal to the first molar. Active tie back was used in 2<sup>nd</sup> quadrant for space closure. Continuous T-Loop was used in lower arch for space closure.



Fig. 7: Post-treatment extra oral photographs



Fig. 8: Post-treatment extra oral photographs

## 3. Discussion

Systemic and local criteria can be used to categorise the canine ectopic eruption. McBride claims that "the failure of permanent teeth to erupt into their normal position in the dental arches are typically caused by an imbalance in the size of the teeth and overall arch length.<sup>6</sup> The maxillary Cuspid's eruption path is more challenging and complex than any other teeth. The most effective method of decrowding the anterior segment of teeth would be to extract all the premolars, retract each canine individually, and realign the canines that are positioned irregularly. Utilizing the differential moments, the maxillary arch uses T-Loops to move teeth effectively. We may obtain the



ideal moment to force ratio by inserting the proper pre-activated bends into the T-Loop. TMA is the best wire to use since it has a lower load deflection rate, and the longer wire used in T-loops also helps to achieve the same result.<sup>7</sup> The optimal moment-to-force ratio needed for tooth movement can be obtained by including sufficient alpha and beta bends in the loop. Because there is no moving of the wire between the brackets, there is no friction, which aids in anchoring management during the individual canine retraction.<sup>8</sup> With the T-loop, however, tooth movement can be precisely controlled in a predictable way. A moment differential could be obtained by using an asymmetric T-loop. Enhancing anchoring control and force system predictability is maintaining the moment differential as the extraction spaces close.<sup>9</sup>

#### 4. Conclusion

In some cases, utilising segmental mechanics can be the best option, and it can also help prevent the unintended movements that continuous mechanics can create. The anterior segment is simultaneously decrowded and the individual canine is distalized here by individual canine retraction. This case report demonstrates how a blocked out canine situation can be successfully treated with careful planning of the extraction procedure and orthodontic mechanics to give mild, controlled force. Aligning the teeth simultaneously along with retraction of canine will shorten the duration of treatment while torque control is difficult to manage. However, slight torque loss was present in right maxillary canine at the completion of treatment.

#### 5. Conflict of Interest

None.

#### 6. Source of Funding

None.

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