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**Case Report**

# Orthodontic management of buccally erupted ectopic canine in a 12-year-old child

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## ABSTRACT

Ectopic teeth are teeth that develop displaced from their normal position. Any permanent tooth can be ectopic, and the cause may be both genetic and environmental. Ectopic buccally erupted maxillary canines are one of the most frequently encountered conditions because of its long path of eruption. Re positioning of these tooth is important because ectopic canine teeth can migrate in the jaw bone and may damage the adjacent teeth roots and bone. Treatment is also justifiable for aesthetic reasons. Diagnosis and treatment of ectopically erupting permanent maxillary canines requires timely management by the orthodontist. Internal or external root resorption of teeth adjacent to the ectopic canine is the most common sequel. Malocclusion with severe crowding is difficult to treat without extraction. Non-extraction treatment of ectopic canines can compromise the patient's profile. This article presents a cases of extraction treatment approach for buccally displaced or ectopic canine in a patient.

**Keyword:** Ectopic eruption, Maxillary canines, Orthodontic treatment

## INTRODUCTION

Ectopic buccally erupted maxillary canines are one of the most frequently encountered conditions in orthodontic practice. The prevalence of permanent maxillary canine impaction or ectopic eruption in the general population is approximately 1-2%.[1,2] Palatally displaced canines (PDC) occur twice as frequently as buccally.[3]

Ectopic canines are believed to occur with a wide variety of systemic and local etiologies (Table 1). 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.[4]

**Table 1: Etiologic factor of ectopic canines.[5]**

| Genetics | Local environmental | Systemic environmental |
|---|---|---|
| **Heredity malposed tooth germ** | Prolonged retention of primary teeth reduced root length of adjacent lateral incisor ankylosis of permanent canine | Endocrine deficiency |
| **Shortened arch length alveolar cleft** | Degree of dental crowding and spacing failure of primary canine root to resorb small or congenitally missing lateral incisors | Febrile diseases |

Diagnosis of permanent canine eruption irregularities begins with clinical observations of the patient. The first

sign of ectopic eruption is seeing unerupted permanent canines when a patient's dental development appears average relative to the chronologic age. The following must be considered during clinical evaluation of the patient: (1) the amount of space in the arch for the un-erupted/erupted ectopic canine, (2) the morphology and position of the adjacent teeth, (3) the contours of the bone, (4) the mobility of teeth, and (5) the radiographic assessment to determine the position of the canine; its apex, crown, and direction of longitudinal axis.

## CASE REPORT

A 12-year-old male patient reported with a chief complaint of irregularly placed teeth in the upper front teeth region with mesocephalic head pattern and mesoprosopic facial form. The patient exhibited straight profile with competent lips. Bilateral angle's class I molar relationship was evident.

Clinically, ectopically buccally erupted left maxillary canines was evident. Overjet was 3 mm and overbite was 3 mm. A comprehensive clinical and database analysis was done.

### *Treatment objectives*

The treatment objectives were to correct the ectopic position of the maxillary canine, maintaining the maxillary midline discrepancy, establish a Class I molar and canine relationship, relieve the crowding on both arches, obtain a normal overjet and overbite, and improve the patient's profile.

### *Treatment plan*

On the basis of diagnostic records, a treatment plan to correct the ectopic position of the maxillary canine through extraction was selected. The rationale was to avoid compromising the patient's profile and for a more stable treatment result. Developing maxillary and mandibular third molars will be monitored.

### *Treatment*

Extraction wrt 24 was done as non-extraction treatment involves a longer treatment time to correct and would increase the chance of adversely affecting the patient's profile by proclining the incisors. Non-extraction treatment also increases the chance of enamel demineralization due to the extended amount of time in appliances. Extraction treatment gives more stable result because arch form is maintained.

Mechanotherapy using MBT appliance were placed on maxillary arch. Bracket was placed from 15, 14, 13, 12, 11, 21, 22, 23, 25 and molar band with tube was placed on 1st molars 16 and 26. 0.014 NiTi archwire was engaged barring 23 (Figure 1). E-chain was engaged from 23 to 26 to retract the canine and bring it in the space above the extracted 1st premolar space (Figure 1). After 3-month followup, a significant amount of retraction of canines had been made. Canine is positioned above 1st premolar. Now canine is also engaged in the 0.014-in nickel-titanium archwire (Figure 2). After 2 months of treatment, a significant amount of progress had been made in aligning the maxillary arch to accommodate the left ectopic canine in proper position in maxillary arch (Figure 3). Band and brackets were removed and retainer was placed to prevent relapse (Figure 4 and 5).

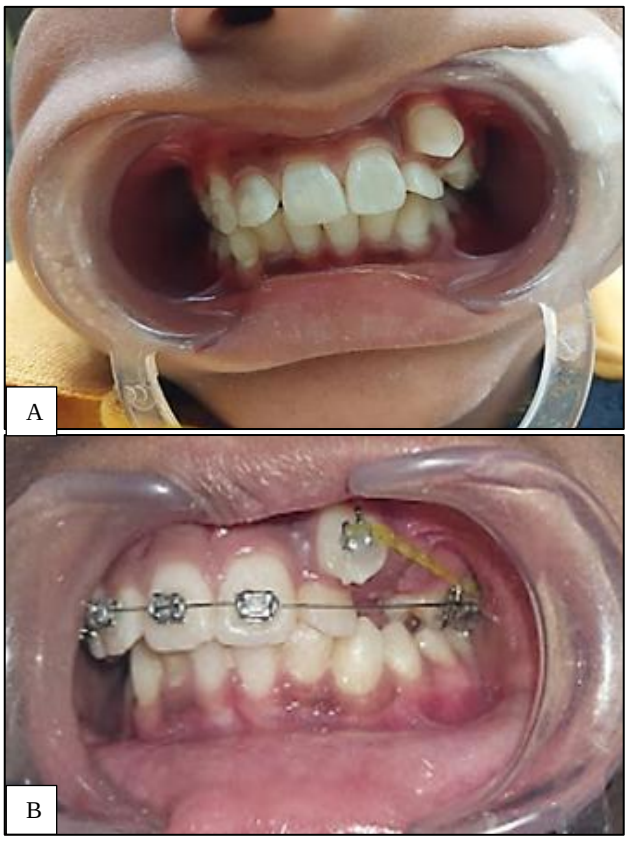


**Figure 1 (A and B): A-Pre-operative photograph and B-Bracket placed from 15, 14, 13, 12, 11, 21, 22, 23, 25 and molar band with tube was placed on 1st molars 16 and 26. E-chain engaged from 23 to 26.**

**Figure 2: Canine is engaged in the 0.014-in nickel-titanium archwire.**

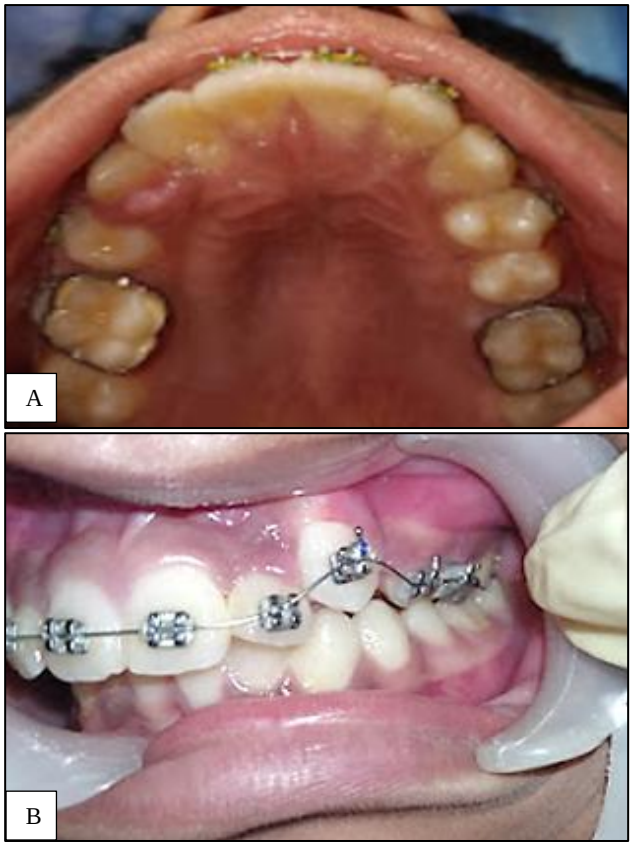


**Figure 3 (A and B): After 3-month followup maxillary arch is aligned to accommodate the left ectopic canine in proper position in maxillary arch.**

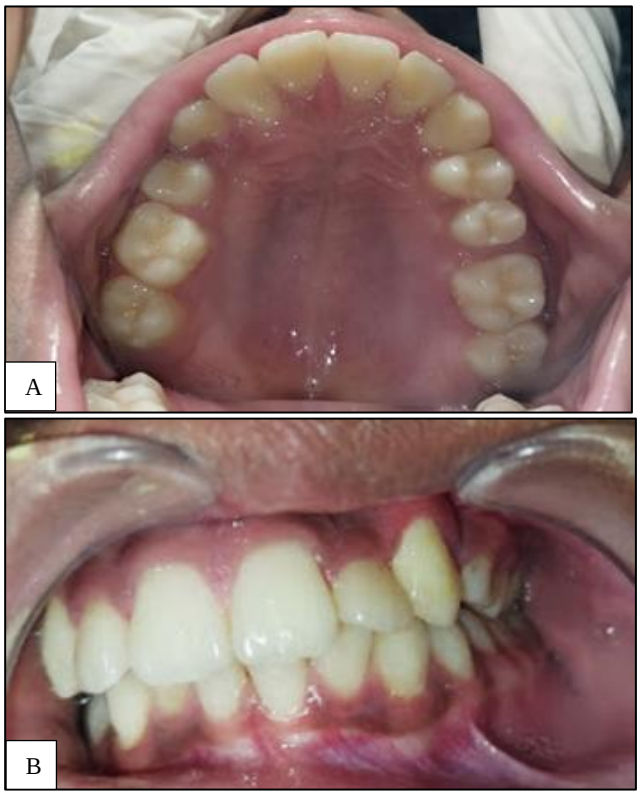


**Figure 4 (A and B): Band and brackets were removed.**

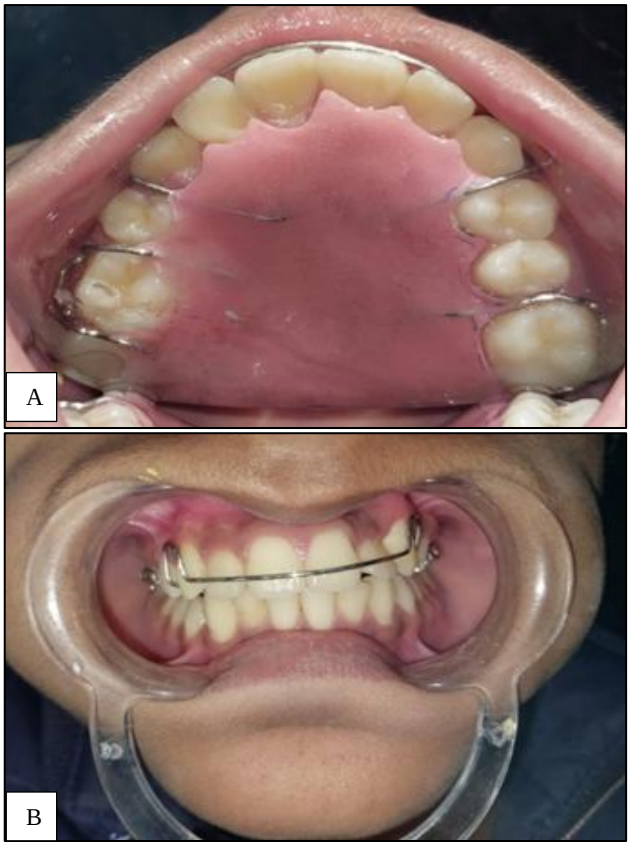


**Figure 5 (A and B): Retainer was placed to prevent any relapse.**

## DISCUSSION

Maxillary canines that are potentially impacted/ectopically erupting may be inadvertently overlooked in the mixed dentition patient. This is due to individual variations in eruption patterns and timing. Periodic panoramic and selective periapical radiographs along with careful clinical examination that includes intraoral palpation permits early diagnosis of unerupted, ectopic, and potentially impacted permanent canines. When such a diagnosis is apparent, timely interceptive therapy may then be instituted.

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. During palpation of the intraoral structures, the operator should also evaluate the mobility of all the teeth present. Mobile deciduous canines may indicate normal resorption of the roots by permanent successor. However, mobility of permanent lateral incisor may indicate potential root resorption by impacted canine.

If the eruption pattern of the permanent canines appears to be destined for impaction or ectopic eruption, most authors agree that the primary canine should be extracted.[6-8] This in fact has been shown to be effective in up to 91% when the permanent canine is located distal to the long axis of

the lateral incisor, yet only 64% effective when canine overlaps medially to long axis midline of lateral incisor.[9]

In the above case reports adequate results were achieved through an extraction treatment approach. If the four premolars were not extracted, it might have resulted in proclination of the maxillary and mandibular anterior teeth with a harmful result to the patient's soft tissue profile. By extraction treatment approach, it is much easy to correct the crowding and achieve more stable results.

Crowding is found in a minority of PDC cases, and most of the palatally impacted canines occur when excess space is available in the dental arch.[10-12] In contrast, buccal displacement of the maxillary canines has been strongly associated with crowding.[10,13] Jacoby reported that only 17% of BDC subjects presented sufficient space for eruption in arch. Oliver et al found that BDC were more frequent in Orientals who also displayed more crowding, whereas PDC was more frequent among Caucasians.[9,14]

Becker et al reported reductions in bucco-lingual and M-D tooth sizes of males with PDC, compared with male controls, whereas the teeth of females were similar in size to the female controls.[15] Tooth size and dental arch dimensions are determining factors in dental crowding, but no reported attempts have so far been made to study the specific reason for the dentoalveolar disproportion (lack of space) found in the majority of subjects with BDC.

The BDC and PDC diagnosis was made on the basis of a clinical examination and diagnostic radiographs, according to established standardized techniques.[16,17] In those cases where the canines were initially unerupted and surgical exposure was required as an integral part of their treatment, this was always performed in the presence of the orthodontist, for objective treatment reasons, and included visual confirmation of radiographic diagnosis.

## CONCLUSION

The successful treatment of a patient with an ectopic tooth can be a challenging task. Proper treatment of an ectopic canine patient with severe crowding requires careful treatment planning.regular follow and patient motivation is very important for the success of treatment. 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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