

**CASE REPORT*****A stretch in time saves the occlusion***Niharika Sharma<sup>1</sup>, Karishma Gautam<sup>1</sup>, Sakshi Singh<sup>1</sup>, Priyanka Biswas<sup>1</sup>**Abstract**

*Ectopic eruption of maxillary canine is an anomaly encountered in children. Labial eruption of canine is less common than the palatal eruption. But in case of Asian populations, the labial canine eruption is more common than the palatal.*

*In the present case fourteen years old boy reported to the department with ectopic eruption of left permanent canine where in the canine was guided normal pathway of eruption after rapid palatal expansion. The combination of rapid palatal expansion with fixed orthodontic treatment was effective in proper repositioning of maxillary canine.*

*Under rapid palatal expansion the widening of the circumference of the palate takes place along with the increase in perimeter of the dental arch to create more space for the growth of the teeth.*

**Key words: Impaction, Rapid palatal expansion, Eruption**

**Introduction**

Rapid Maxillary Expansion (RME) orthopedically expands the maxillary dental arch and palate through distraction of the mid-palatal suture. Used to resolve different malocclusions, such as transverse discrepancy (TD), posterior crossbite (PC), and dental crowding.<sup>1</sup>

Frequently occurring ectopic tooth is the maxillary permanent canine, and occurs in 1-2% of population. It has been reported that incidence of palatally placed canine is higher than the labially placed canine. But in case of Asian population the incidence of labially placed canine is more.<sup>2</sup>

The etiology of ectopic eruption inculcates various causes such as arch length discrepancy which is found to be the chief cause of the labial eruption. The other factors for the labial ectopic eruption could be a delayed exfoliation of deciduous canine, disturbance associated with the follicle of the unerupted tooth which influences the direction of eruption and contribute to the displacement of the maxillary canine, root dilaceration and genetic factors.

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Ericson and Kuroi estimated the incidence in Swedish population females to about 1.17% and in males 0.51%.<sup>3</sup> An ectopic erupted canine lead to the movement of adjacent teeth, root resorption of neighboring teeth, referred pain, infection, and dental crowding.

The need of the hour is the correction of Ectopic eruption of canine by the interceptive means. Early diagnosis is mandatory to prevent the ectopic eruption of the canine and malocclusion as it can lead to the compromised profile of the patient.<sup>1</sup>

The following case represents the ectopically erupted left maxillary canine which has led to the malocclusion along with compromised aesthetics which was corrected and guided to proper occlusion by rapid palatal expansion followed by fixed orthodontic treatment.

**Case report**

Fourteen years old boy reported to the department of pediatric dentistry with the chief complaint of irregularly placed teeth. On clinical examination it was revealed that the lateral incisor was slightly palatally placed, left canine ectopically erupted as there was less space in the arch for the accommodation of canine and mild crowding was present along with anterior open bite. (Fig 1 and 2).





(Fig.1 and 2)

Radiographic examination (orthopantomogram) was conducted to check the correct position of the canine and the space available to accommodate the canine in the arch. (Fig 3)



(Fig.3)

After model analysis it was revealed that the space available was 7mm less for the accommodation of the canine, hence expansion of the arch would be required. Thus, rapid palatal expansion was considered as the treatment modality where the bonded hyrax appliance was placed. (Fig 4)

After the placement of hyrax appliance, the patient was asked to turn the screw with the help of key.



(Fig.4)

Once the key is all the way in the safety bend the key was pushed inside and rotated around until the next hole becomes visible in the expander. The patient was advised that after the key was turned, he might feel tingling around the bridge of nose and around the eyes. As the patient was 14 years old so was instructed to turn the key 180 degrees

with one turn of 90 degrees both morning and evening. Patient was recalled after three weeks. As the central incisors are located on different sides of sutures, they were set apart when the palate got expanded, thus led to formation of midline diastema. The gap was formed after 3 weeks which was desirable. (Fig 5)



(Fig. 5)

The gap indicated that the mid-palatal suture split has occurred. The hyrax screw was then locked for three months so that proper ossification in the mid palatal suture occurs. Further by the means of placement of fixed orthodontic brackets the mid line diastema was closed (fig 6)



(Fig 6)

As there was an increase in arch width the ectopic canine regained its original position and alignment of teeth was done by fixed orthodontic treatment followed by stabilization with fixed lingual bonded retainer. (Fig 6, Fig 7.1 and 7.2)



(Fig 7.1)



(Fig. 7.2)

### Discussion

The eruption of buccally ectopic canine usually occurs despite adequate space in the dental arch.<sup>5</sup>The chief reason could be the primary tooth displacement which means the tooth develops in an aberrant site or with unusual orientation.<sup>6</sup> Diagnosis of the permanent canine ectopic eruption starts with the clinical observations of the patient. Firstly, the ectopic eruption's sign is when the patient's dental development appears average relative to the chronological age.<sup>5</sup>The factors which should be kept into considerations is the amount of space available in the arch, morphology and the position of the adjacent teeth, the contours of the bone, mobility of teeth and radiographic assessment for the determination of the position of the canine, its crown, apex, and longitudinal axis.<sup>7</sup>

In the present case as the amount of space available in the arch for the eruption of the canine was not sufficient, therefore various treatment modalities were considered such as:

- Extraction of maxillary premolar.
- Distalization of the maxillary molars and premolars on the affected side.
- Rapid palatal expansion.

In the present case rapid palatal expansion was considered as the treatment of choice as non-extraction treatment instills a longer treatment time to correct but would reveal the promising results.<sup>8</sup>

Rapid palatal expansion has unique significance in dentofacial therapy. It is also called as split palate as it is a type of expansion which serves the base for the separation of the mid palatal suture and movement of the maxillary shelves from each other. The attachments of - maxillary sutures is quite tenacious due to the buttressing effect which is strong enough posteriomedially and posterosuperior laterally. Person and Thelander demonstrated that palatal sutures show obliteration during juvenile period. They investigated in the histological study that sutures close from 15 to 35 years of age where marked degree of closure was rarely seen in third decade of life.<sup>8</sup>

The indicated cases for performing RME are:

- Lateral discrepancies that lead to unilateral or bilateral crossbites.
- Anteroposterior discrepancy as with Class II division 1 malocclusion with or without posterior cross bite.
- Class III malocclusion
- Pseudo Class III problems.

Appliances used for the RME are:

- Tissue borne: Haas type expansion.
- Tooth borne:  
Banded-Hyrax or Biedermann type. Bonded maxillary expansion-Minne Expander or Isaacson type.

In the present case hyrax was used to serve the purpose. Rate of expansion by appliance is 0.3-0.5 mm per day so that the active expansion might get complete in 2-4 weeks, leaving time for the cellular response of osteoclasts and osteoblast. Expansion should stop when the maxillary palatal cusps are level with the buccal cusps of the mandibular teeth. In young growing patients two turns each day for first 4 to 5 days and one turn each day for the remainder of RME treatment. In adults non growing patients as the skeletal resistance is high two turns each day for first two days and one turn every other day for the remainder of RME treatment for the next 5 to 7 days and one turn every other day for the remainder of RME treatment.<sup>9</sup>

The effect of RME on maxillary posterior region is such that it causes bending and compression of periodontal ligament with marked change in the long axis of teeth. To a limited extent buccal tipping and extrusion also occurs.<sup>10</sup> The nasal width and volume increases because of RME. Nihat kilic et al. in their study concluded that the soft tissue angle decreases and the H angle and profile convexity increases after RME. Advancement in RME is also being done by surgery that is Surgically Assisted Rapid Palatal Expansion.<sup>10</sup>

Tang H et al. found that lithium treatment could aid to improve stability of ortho treatment such as RME due to the reason that beta catenin formation leads to new bone formation.<sup>9</sup>

### Conclusion

Ectopic tooth treatment and severe crowding is a challenging task and needs proper diagnosis and careful examination. Aesthetics is the prime goal in the light of attention. In the presented case report the treatment done by RME followed by fixed orthodontic treatment had provided accurate results and has fit as a fiddle.

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