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Case Report

Orthodontic management of labially erupted canine with ceramic brackets: A clinical case report

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ABSTRACT

Labial displacement of permanent maxillary canines is most frequently associated with insufficient space of arch, any permanent tooth can be ectopic, and its cause could be both genetic/environmental. To achieve aesthetics orthodontic treatment is justifiable. Time management is important for diagnosing and planning of ectopically erupted teeth. The most frequent aftereffect is internal or exterior root resorption of teeth next to the ectopic canine. Without extraction, malocclusion with crowding is challenging to correct. This article describes a case of chairside CEREC (Chair-side Economical Restoration of Esthetic Ceramic) crown placement and orthodontic aesthetic care of a labially erupted canine using ceramic brackets.

1. Introduction

Ectopic maxillary canines that have erupted buccally or labially are among the most commonly encountered condition seen in orthodontics. In the general population, permanent maxillary canine ectopic eruption affects 1-2% of people.[1,2] Palatally displaced canines (PDC) occur two times as frequently as buccally.[1–3] However, buccally displaced canines (BDC) are commonly seen in practice. It has not been demonstrated that a single etiology may account for the majority of ectopic eruptions or provide a differential explanation for those that arise either labially or palatally. This abnormality may have been caused by environmental variables during the long and winding eruption course. Another possibility that could account for the displacement of the maxillary canine is that a disturbance related to the follicle of the unerupted teeth could affect the direction of eruption.[4]

The fact that canine impactions happen in families raises the possibility of a genetic or family inheritance pattern. For the anomaly, Peck and Peck proposed a multifactorial genetic pattern of inheritance.[5]

Consequently, interceptive treatment is necessary in order to create the space required for the canine and guide it into the correct position.[6] Previous studies have shown that the inclination and the initial vertical position of unerupted labially displaced maxillary canines have a decisive impact on their likeliness of spontaneous eruption.[7] Ceramic brackets are known for their hardness. They are notably harder than enamel.[8] A clinical study performed by

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Lindel et al.[9] concluded that ceramic brackets exhibit less long-term biofilm accumulation than metal brackets.

In this case management of labially erupted canine and impacted primary canine is presented with ceramic brackets and extractions followed with chairside crown placement.

2. Case Report

A 16- year-old adolescent presented with the chief complaint of irregular & broken teeth in upper front tooth region. The patient's medical history was not significant but had dental history of trauma 3yrs back which was asymptomatic history was non-contributory to the condition. Oral hygiene routine and habits were also evaluated on counter. The initial intraoral examination showed class II molar relationship, impacted maxillary right canine with anterior deep bite and crowding in mandibular arch and labially erupted right canine. Patient also had fractured maxillary right central incisor. (Figure 1a,b)

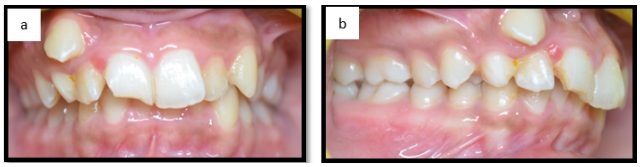

Figure 1: a,b: Pre- treatment images

The panoramic radiograph showed no pathologies in any of the arches. Both the maxillary and the mandibular third molars were developing. (Figure 2)

Figure 2: Pre- treatment OPG

2.1. Treatment objectives

The goals of the treatment were to establish proper canine relationship and correct the ectopic position of the maxillary canine reduces crowding on both arches, achieve a normal overjet and overbite, and enhance the patient's profile thereby restoring form & function of broken tooth.

2.2. Treatment plan

A treatment plan to extract the impacted maxillary canine and correct the permanent ectopic canine position was chosen based on the diagnostic reports. The goal was to achieve more stable course of treatment rather than jeopardizing the patient's profile. Third molar development in the mandible and maxilla will be observed with crown placement in maxillary right fractured central incisor.

2.3. Treatment alternatives

Various treatment options have been discussed to correct maxillary ectopic canines. Extraction treatment of the maxillary first premolars with maximum anchorage on the maxillary and mandibular arch to correct the canine relationship and crowding in the mandibular arch was one option. Another option was distalization of maxillary molars and premolars of the right side to create space in order to accommodate the canine by extracting the mandibular first premolars to correct the crowding with maximum anchorage. However, non-extraction treatment involves a longer treatment time and increase in the chances of adversely affecting the patient's profile by incisor proclination. Because the arch form is preserved, extraction therapy produces results that are more stable.

2.4. Treatment progression

Patient and her parents were explained for the treatment procedure and an informed consent was taken. Following the eruption of all the permanent teeth, firstly impacted canine was extracted thereby creating space for the retraction of ectopically erupted maxillary right canine. 3M^{TM} Clarity^{TM} Advanced Ceramic Brackets and 0.018 wire were bonded in the maxillary arch. (Figure 3a,b)

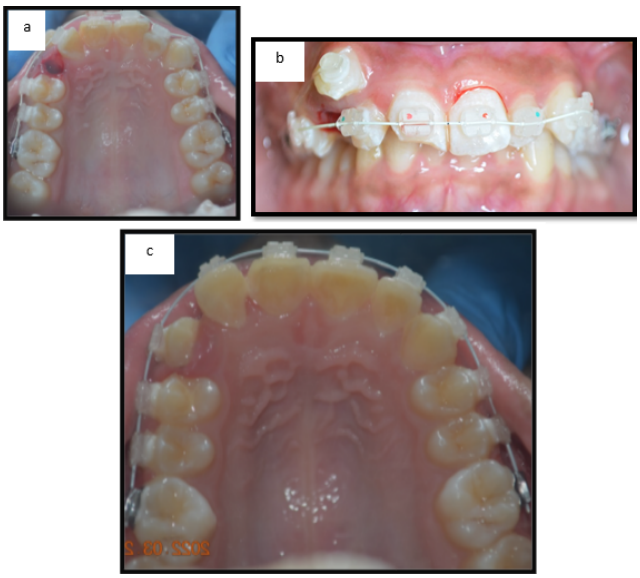

Figure 3: a,b,c: Extraction of impacted canine followed with ceramic bracket and arch wire placement

Further, extraction of maxillary first premolars was done followed by retraction. (Figure 4)

Figure 4: Extraction of maxillary first premolars

The patient opted for elastic ligatures in the color screaming yellow. The arch wire changes where necessary were done at regular intervals to continue aligning and levelling.(Figure 5a,b,c)

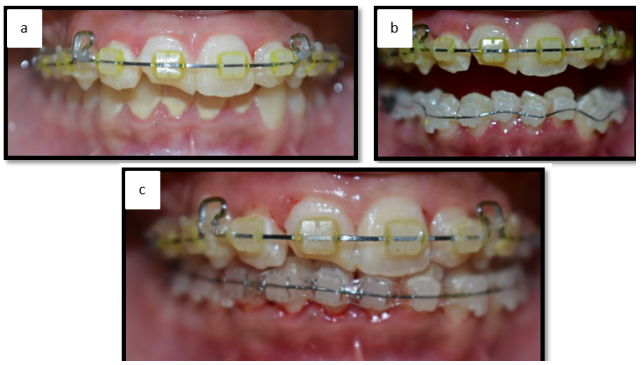

Figure 5: a,b,c: Yellow elastic ligature with placement of archwire in mandible

Alignment was completed after nearly 10 months of treatment. The maxillary canines had already reached their correct vertical position in the arch. The arch form was nicely developed. No intrusion and tipping of the premolars on front area were seen. In order to achieve anchoring, several final procedures were carried out in each jaw between the canines and premolars at the follow-up visits. For, retention, retainers were given to the patient to prevent any relapse. (Figure 6)

Final aesthetic improvement was done by chairside placement of zirconia crown in maxillary right central incisor. The final result provides an attractive smile with satisfied patient. (Figure 7a,b)

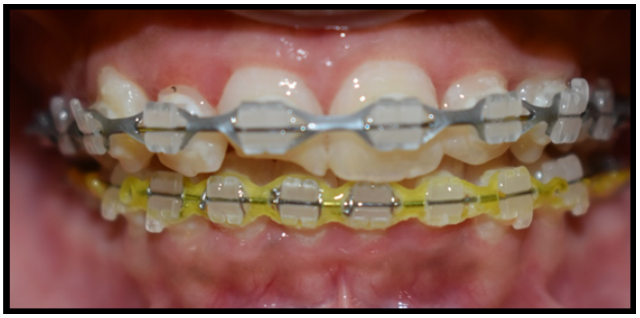

Figure 6: Aligning teeth

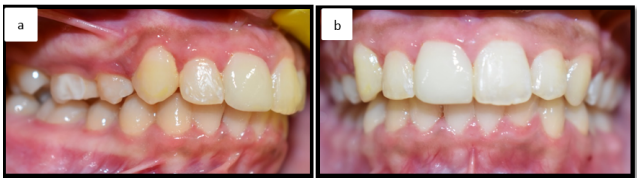

Figure 7: a,b: Final aesthetic outcome

2.5. Treatment results

The post-treatment records revealed that the treatment objectives were effectively achieved showing an improved facial profile. (Figure 8)

Figure 8: Improved facial profile

3. Discussion

In patients with mixed dentition, maxillary canines that may be impacted or ectopically erupting may go unnoticed. Individual differences in the timing and pattern of eruptions might be the cause. Early detection of unerupted, ectopic, and perhaps impacted permanent canines is made possible by routinely taking selected and panoramic periapical

radiographs and conducting a thorough clinical examination that includes intraoral palpation. Prompt implementation of interceptive therapy may follow the identification of such a diagnosis.

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.[10,11] Non-extraction treatment increases the chance of enamel demineralization due to the extended amount of time in appliances.[12,13] Line of treatment with extraction gives more stable result because arch form is maintained. Most of the palatal canine impactions occur due to excess space is available in the dental arch.[14–16] In contrast, buccal displacement of the maxillary canines has been strongly associated with crowding.[14,17]

Therefore, in our case too we opted for the extraction of premolars and impacted canine in order to achieve the final outcome. If the premolars were not extracted, it might have resulted in proclination of the maxillary and mandibular anterior teeth with an unaesthetic result to the patient's soft tissue profile. By extraction treatment approach, it is much easier to correct the alignment and achieve more stable results.

4. Conclusion

Treating a patient with crowding and an ectopic tooth can be a difficult. A clinician must carefully plan therapy in order to treat an ectopic tooth patient with significant crowding. The decision to excise the premolars was made with the patients' best interests, functionality, and stability in mind. Today's treatment plans for patients with ectopic canine must take into account factors beyond the orthodontic outcome; given the emphasis being placed on aesthetics as the primary goal of therapy for both the patient and the practitioner in that case chair side restoration gives quick and satisfactory outcome.

5. Source of Funding

None.

6. Conflict of Interest

None.

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