

ORTHODONTIC MANAGEMENT OF BUCCALLY ERUPTED ECTOPIC CANINE FOLLOWED BY SMILE DESIGNING BY INTERDISCIPLINARY APPROACH : A CASE STUDY

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ABSTRACT

The permanent canines are a key tooth in the maxillary arch that defines the smiles arc. Maxillary canines are the most common ectopic teeth in young people. Ectopic buccal eruption of maxillary canines is strongly associated with lack of space or crowding in the dental arch. This report demonstrates the management of a buccally erupted maxillary canines in an 12-years old female without sufficient space with non extraction procedure. In the anterior zone the relative positioning of the gingival margin has a critical role in the overall aesthetics of the patients. Combined orthodontic and periodontal procedures can be used to establish the proper levels of the gingival margins.

KEY WORDS

Ectopic canine, Incisal crossbite, aesthetic smile, Orthodontic - Periodontic approach.

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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^{1,3}. However, buccally displaced canines (BDC) are commonly seen in practice. Orthodontic treatment is justified because ectopic canine teeth can migrate in the jaw bone and may damage the adjacent teeth roots and bone. Orthodontic 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.

Aesthetic Dentistry is, more and more, arousing interest and playing an important role in the dentists clinical routine, as well as in patients' lives, especially nowadays where media promotes the beauty in wonderful faces and perfect smiles, and they are all related with good health and mental/physical well-being.⁴ The integration among various specialties became basic and necessary in today's dentistry to perform a complete dental treatment. The contour of the gingival tissue surrounding the teeth also plays an important role in providing an optimal aesthetic appearance in the maxillary anterior sextant and affects the harmonious appearance of a smile. Consequently, any dental procedure performed in this zone will be an aesthetic challenge because of its visibility⁴. The physiological gingival architecture has been described as one that consists of knife-edged gingival margins tightly adapted to the teeth, interdental grooves and cone-shaped interdental papilla^{5,6}.

This article represents a case of orthodontic treatment approach for buccally displaced or ectopic canine in a patient with gingival levelling along with bone sounding for more aesthetically sound result for that patient.

CASE REPORT

A 12 years old female patient came to the department with complaint of irregularly arranged teeth. On extraoral examination patient had mesoprosopic facial type with straight profile. Intraoral examination revealed presence of high labially placed canine on both the left and right quadrant of upper arch with insufficient space available on both sides. Midline diastema was present in upper arch. 12 and 22 were in crossbite position. Molar relation was class I bilaterally.

Cephalometric analysis revealed Her cephalometric values show her to be the case of skeletal class III jaw base with ANB angle of -10 and wits appraisal of -1mm . No any other defects were

found in temporomandibular joint and surrounding structures. So she was diagnosed with the case of skeletal Class III with dental class I Malocclusion with high labially placed canines and crossbite of 12 and 22.

TREATMENT OBJECTIVES

The treatment objectives were to -

1. Correct the 12 and 22 crossbite
2. Close the midline diastema
3. Placement of high labially placed canines into the arch and achieve class I canine relation bilaterally.
4. Maintainance of aesthetic smile.



FIG 1: Extraoral and Intraoral Photographs

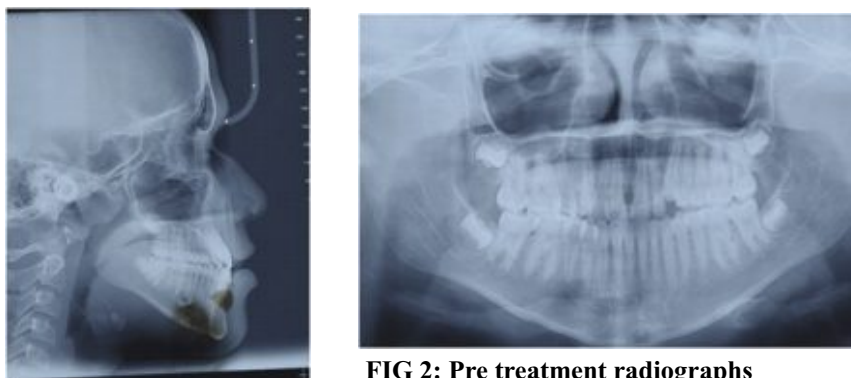


FIG 2: Pre treatment radiographs



FIG 3: Midtreatment intraoral photographs



FIG 4: Gingivectomy with bone sounding



FIG 4: Gingivectomy with bone sounding

TREATMENT PROGRESS

Patient was planned to be treated with fixed mechanotherapy using MBT (0.022X0.028 slot) for both the upper and lower arch. Initial alignment was achieved with 0.012 inch, 0.014 inch, 0.016 inch, 17X25 inch NITI arch wires. In upper arch 19X25 SS arch wire placed with open coil spring. After opening up of sufficient space the canines were engaged with the main arch wire using 0.012 inch superelastic NITI wire using piggyback method bilaterally.

After full arch alignment and levelling it was seen that the gingival levels in the upper anterior teeth were not proper. Periodontal consultation was done for the patient to correct the gingival level and

contouring of the gingival zenith and to maintain proper smile aesthetics for this young patient. Dept of Periodontics suggested crown lengthening Gingivectomy procedure with subsequent bone sounding. With patient's consent Periodontal surgery was done after debonding of the brackets.

TREATMENT RESULTS

The total treatment duration was 22 months. Post-treatment evaluation showed that patient's complaints had been addressed. Teeth were esthetically pleasing while smiling. Upper and lower arches were well aligned. All spaces were closed



FIG 6: Post treatment intraoral photographs

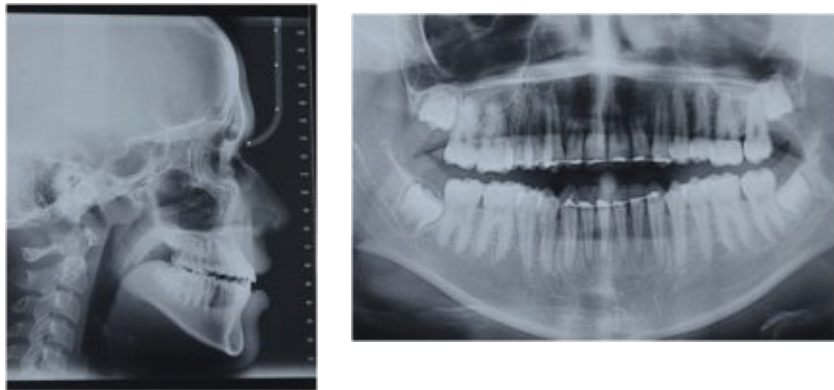


FIG 7: Post treatment radiographs

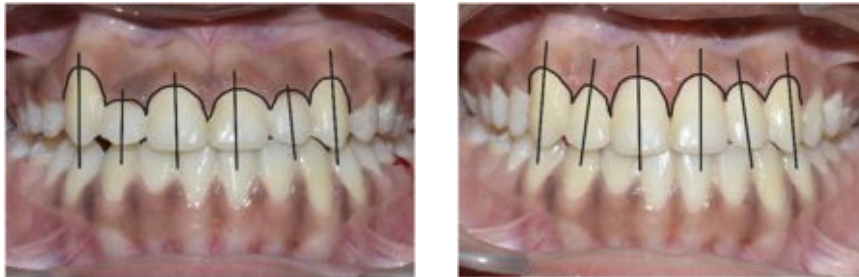


FIG 8: Comparison between gingival level before and after gingivectomy

successfully. Posterior occlusion had good overall intercuspation and was well settled in a Class I relationship. Class I canine relation was achieved. Normal overjet and overbite were achieved. Upper and lower dental midlines were compatible with facial midline.

DISCUSSION

Maxillary canines that are potentially impacted or 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 a 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 instituted⁷.

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. In the above case report adequate results was achieved through an non-extraction treatment approach as the pre treatment records showed scope

Parameter	Pre treatment	Post treatment
SNA	85 ⁰	85 ⁰
SNB	86 ⁰	86 ⁰
ANB	-1 ⁰	-1 ⁰
Wit's Appraisal	-1mm	-1mm
Upper CI to NA (linear/angular)	4mm/25 ⁰	7mm/31 ⁰
Lower CI to NB (linear/angular)	5 mm/24 ⁰	4mm/22 ⁰
IMPA (Tweed)	88 ⁰	87 ⁰
F M A	33 ⁰	33 ⁰
Y (growth) axis	60 ⁰	60 ⁰
Jarabak's ratio	61%	60%
Nasolabial angle	99 ⁰	97 ⁰
Ricket's E line U/L	-3mm / 0mm	- 4mm / 0mm

for expansion on the upper arch. It has resulted in limited proclination of the maxillary anterior teeth with no harmful result to the patient's soft tissue profile.

The relative level of the gingival margins of the six maxillary anterior teeth has a significant influence on the aesthetic appearance. In the aesthetic zone the gingival margins of the maxillary central incisors are even, the lateral incisors even with each other but about 0.5mm coronal to that of central incisors and the gingival margins of the canines about 0.5mm-1.0mm apical to those of the maxillary lateral incisors. The contour of labial gingival margins are usually even with the greatest height slightly distal to the centre of the tooth. The height of the papilla is usually halfway between the incisal edges.

CONCLUSION

The successful treatment of a patient with an ectopic tooth can be a challenging task for an orthodontist. Proper treatment of an ectopic canine patient with insufficient space requires careful treatment planning by the orthodontist. 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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