

# Managing A Case of Bilateral Congenitally Missing Maxillary Lateral Incisors by First Premolars Substitution and Ectopically Erupted Permanent Canines - A Case Report

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## ABSTRACT

Orthodontic treatment of cases with congenitally missing unilateral or bilateral lateral incisors is always challenging in terms of treatment planning. Space management of such cases which also present with retained primary canines mind boggle an orthodontist whether to close space orthodontically, or maintain the space and place prosthesis. Here we are presenting a case where space management of lateral incisors space has been done satisfactorily with teeth substitution and orthodontic treatment mechanics only.

**KEYWORDS:** congenitally missing lateral incisors, ectopic canines, teeth substitution

## INTRODUCTION

Ectopic maxillary canines are one of the most frequently encountered conditions in orthodontic practice having 1-2 % prevalence rate in general population.<sup>1,2</sup> Palatally displaced canine is seen twice as much of the buccally placed canine.<sup>3</sup> Ironically, buccally placed canines are seen more in clinical practice.<sup>4</sup> Some of the common causes for canine's ectopic eruption or its impaction are genetic predisposition, anomalies in maxillary lateral incisors, and inadequate arch space.<sup>5,6</sup> Orthodontic treatment for patients with unilateral or bilateral congenitally missing lateral incisor poses a challenge mainly with regard to treatment planning i.e. orthodontic space closure or space opening for prosthetic replacement. The use of a diagnostic setup is one of the most important aids in the decision-making process in such cases.<sup>7</sup> This present case report shows managing lateral's space with substitution of first premolars and bringing the ectopic canines in their correct position.

## CASE PRESENTATION

### Diagnosis

A 19 year old female patient reported with the chief complaint of highly placed upper front teeth. Patient was a diagnosed case of asthma for which she was

using steroid as an inhaler requiring no specific alteration in orthodontic treatment mechanics apart from analgesics. On examination she was found to be mesoprosopic and mesocephalic. Mild crowding in mandibular arch and severe crowding was evident in maxillary arch. Bilateral maxillary lateral incisors were missing and their space was being replaced by non mobile retained deciduous canines. Bilateral maxillary canines were ectopically positioned buccally and gingival covering seen over left maxillary canine (Figure 1). Molar relation was bilaterally class II and canine relation could not be assessed. However patient had Class II division 2 Type A malocclusion under a Class II skeletal base. Periodontal conditions were favorable for treatment with a fair oral hygiene. The facial pattern was vertical with ANB of 5 degrees and Wits of 2mm. (Figure 2, Table 1).





Figure 1: Pre treatment photographs

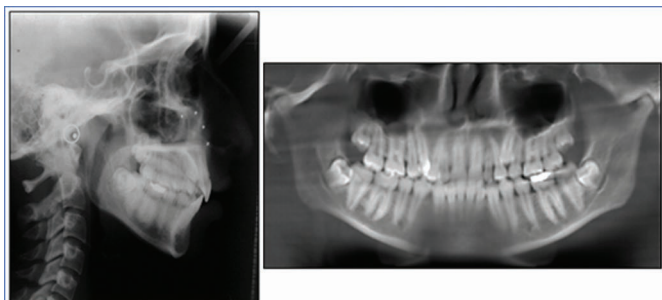


Figure 2: Pre treatment radiographs

### Treatment Objectives

The treatment aimed to address the patient's chief complaint without disturbing the posterior occlusion and thereby not hampering patient's profile post treatment. Hence 2 plans were formulated:

1. Extract bilateral maxillary deciduous canines and create space for lateral incisor prosthesis and also extract 1st maxillary premolars bilaterally to achieve class I canines and ending the case in class II molars.
2. Extract bilateral maxillary deciduous canines and mesialising first premolars and substituting them in place of lateral incisors with sequential reshaping (which may or may not require root canal treatment during the course of treatment) and bringing canines down in their predetermined place thereby finishing in class II molars and class I canines.
3. Patient opted for the 2<sup>nd</sup> plan as it required less number of teeth removal and eliminated the cost burden of fixed prosthesis. A proper informed consent was hence taken from the patient.

### Treatment Progress

Both upper and lower arches were bonded using Roth prescription 0.022" metal brackets and banding was done for both arches first and second molars and 0.014 Niti wires were placed for leveling and aligning. Since first premolars were to be substituted for laterals, hence

maxillary laterals incisors brackets were bonded onto them for correct tip and torque. After initial leveling and aligning mesialisation of maxillary 1st premolars was carried for a period of 7 months on 19x25 ss wire using Niti open coil springs which were activated by 1.5 times interbracket distance of both upper premolars. (Figure 3, 4) Simultaneously sequential reshaping of occlusal surface of premolars was carried to mimic palatal surface of laterals incisors thereby leading to secondary dentin formation and preventing any dentinal hypersensitivity and occlusal prematurity on mouth closure. However no root canal treatment was attempted post debonding as there were no signs of nonvitality or severe hypersensitivity in first premolars. Once sufficient space was created gingivectomy was performed for left maxillary canines and both maxillary canines were brought into the arch. However there was tooth material excess in lower arch which hindered in achieving class I canines, hence slenderisation of lower first premolars by 1mm was carried and lower arch retracted in this space thereby achieving class I canines and class II molars. Post debonding buccal and occlusal surface of substituted teeth were reshaped. The case was settled on 0.014 Premium Australian wire and light midline cross elastics. Total treatment duration was 21 months. Hawleys retainers were given and post treatment patient had a better smile and a satisfactory occlusion. (Figure 5, 6)



Figure 3: Leveling and Aligning



Figure 4: Mid treatment space closure by 1<sup>st</sup> premolars mesialisation



Figure 5: Post treatment photographs

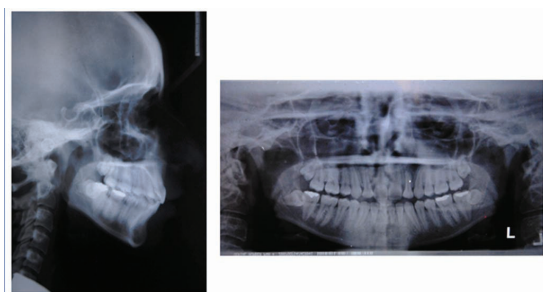


Figure 6: Post treatment radiographs

Table 1: Cephalometric measurements

Parameters	Normal value	Pre-treatment	Post treatment
SNA	81.8 sd 3.7	78	77
SNB	79.2 sd 2.3	74	73
ANB	2.3 sd 1.1	4	5
Wits	0 to -1	-1	2
Co-A	93.6 sd 3.2	84	84
Co-Gn	120.6 sd 4.5	103	105
LAFH	67 - 69	65	65
FMA	24.2 sd 3	35	35
SN-Go-Gn	32	36	37
Gonial angle	128 sd 7	132	130
Cant of occlusion	9	16	14
LI-NB	25/4	26/6	29/6
UI-NA	22/4	11/1.5	13/1
IMPA	90	87	94
Interincisal angle	135	138	132
Overjet	2mm	2.5	1.5
Overbite	2mm	2.5	1.5

**DISCUSSION**

Diagnosis has always been the first step for successful orthodontic treatment. This case report demonstrates an efficient management of bilateral maxillary lateral incisor space by substitution with first premolars. The treatment options available for missing maxillary lateral incisors are space closure, fixed prostheses, and implants.<sup>8</sup> In most of the cases space closure with mesial movement of the maxillary canines would result in teeth with healthy periodontal ligaments occupying the space of the missing teeth.<sup>9</sup>

However, in our case this option could not be carried out as canines were ectopically placed and almost in a transposed position over premolars requiring complex biomechanics, thereby increasing the treatment duration. Hence first premolar mesialisation seemed a suitable and reliable option as less interproximal reduction was required due to almost similar mesio-distal widths and gingival height of lateral incisors and first premolars. To incorporate correct tip and torque in substituted tooth, lateral incisor brackets were bonded on first premolars.

Rehabilitation with a fixed prosthesis also has the disadvantage of reshaping adjacent healthy teeth with or without root canal treatment, and many patients treated with this option are more dissatisfied with the esthetic results than the patients treated with orthodontic space closure.<sup>10</sup>

Rehabilitation with single tooth implant allows teeth to remain in their original positions and avoids extensive grinding of the healthy teeth. However, implant placement must be postponed in young patients until facial vertical growth has ceased.<sup>11</sup> Long term results suggest demerits of both early or late placement of implants i.e. early placement might lead to infraocclusion of prosthesis or uneven gingival margins and late placement would definitely lead to vertical and transverse loss of alveolar bone.<sup>11,12</sup>

**CONCLUSION**

The space management for a missing tooth is always a challenging task for an Orthodontist. Whether to open the space for prosthesis or close the space can be efficiently managed by proper diagnosis, treatment planning and simple biomechanics. The risk benefit ratio should always be kept in mind before attempting such cases.

**CONFLICTS OF INTEREST**

Nil

## REFERENCES

1. Bedoya MM, Park JH. A review of diagnosis and management of impacted maxillary canines. *J Amnt Assoc* 2009; 140:1485-93.
2. Fleming P, Scott P, Heidari N, Dibiase A. Influence of radiographic position of ectopic canines on the duration of orthodontic treatment. *Angle Orthod* 2009; 79: 442-6.
3. Cooke J, Wang HL. Canine impactions: Incidence and management. *Int J Periodontics Restorative Dent* 2006; 26:483-91.
4. Lim D, Manandhar P, Basukala DL: Management of Highly Placed Canine with Multi-Loop. *Orthodontic Journal of Nepal* 2013; 3(2):44-45
5. Vastardis H. The genetics of human tooth agenesis: New discoveries for understanding dental anomalies. *Am J Orthod Dentofacial Orthop* 2000;117:650-6.
6. Peck S, Peck L, Kataja M. The palatally displaced canine as a dental anomaly of genetic origin. *Angle Orthod* 1994; 64:249-56.
7. Mehta S, Valiathan A, Urala A. Treatment of Class II subdivision malocclusion with congenitally missing upper lateral incisors: A case report. *APOS Trends Orthod* 2014;4:70-5.
8. Kokich VO Jr. Congenitally missing teeth: orthodontic management in the adolescent patient. *Am J Orthod Dentofacial Orthop* 2002;121:594-5.
9. Jose N. Torres, Hugo C. P. M. Caracas, Ana Maria Bolognese, and Sandra Torres. Conservative approach for a patient with extreme delay in maxillary lateral incisor development. *AmJ Orthod Dentofacial Orthop* 2012;141:773-82
10. Robertsson S, Mohlin B. The congenitally missing upper lateral incisor. A retrospective study of orthodontic space closure versus restorative treatment. *Eur J Orthod* 2000;22:697-710.
11. Fudalej P, Kokich VG, Leroux B. Determining the cessation of vertical growth of the craniofacial structures to facilitate placement of single-tooth implants. *Am J Orthod Dentofacial Orthop* 2007; 131 (Suppl):S59-67.
12. Brugnolo E, Mazzocco C, Cordioli G, Majzoub Z. Clinical and radiographic findings following placement of single-tooth implants in young patients—case reports. *Int J Periodontics Restorative Dent* 1996;16:421-33.