

## ORTHODONTICS MANAGEMENT OF MISSING CENTRAL INCISOR – A CASE REPORT

**Kumar M<sup>1</sup>, Goyal M<sup>2</sup>, Kumar S<sup>3</sup>**

<sup>1</sup>Professor, <sup>2</sup>Principal and HOD, <sup>3</sup>Postgraduate Student, Department of Orthodontics and Dentofacial orthopedics, Teerthanker Mahaveer Dental college and Research Centre, Delhi Road Moradabad, Uttar Pradesh, India

**Address for Correspondence:**

Dr. Sumit Kumar, Department of Orthodontics and Dentofacial orthopedics, Teerthanker Mahaveer Dental college and Research Centre, Delhi Road Moradabad, Uttar Pradesh, India.

**ABSTRACT:**

Absence of the upper central incisor is a serious problem and often needs a challenging Treatment. Different treatment option include prosthetic replacement, osseointegrated implants, auto transplanted permanent teeth and conservative approach. Dental mimicry of missing teeth with the help of adjacent teeth provides better periodontal health in comparison with implant or fixed partial denture. Although treatment mechanics became challenging because of the asymmetric pattern of the extraction. Literature also reveals patients often prefer the space closure (adjacent tooth mimicry) option because they consider it more conservative and desirable. This case report describes the management of missing maxillary central incisor in 12 year old male patient by sequential dental mimicry of 12, 13, and 14 into 11, 12, and 13 respectively.

**Keywords:** Class I malocclusion, Conservative approach, Dental Mimicry, Missing central incisor, Periodontal health, Space closure.

**INTRODUCTION**

Dental injuries are common in adolescence with avulsion of single or multiple teeth in upper front tooth region. Loss of permanent teeth can cause different type of problem and it can lead to functional, esthetical and psychological disturbances. One of the most challenging problems to the dentist is choice of treatment for above conditions. The treatment is quite complex, prognosis is often uncertain and the solutions include prosthetic replacement, osseointegrated implants, auto transplanted permanent teeth<sup>1</sup> and conservative approach with multidisciplinary team of experts including orthodontist, endodontist and periodontist. This article explains about the conservative approach of avulsed tooth in a male adolescence with multidisciplinary team of experts.

revealed an episode of traumatic injury irt 11 two months ago. On extra oral examination patient had mesocephalic, mesoprosopic, average to convex facial profile, incompetent lips with interlabial gap of 6mm. Other maxillary incisor did not show any change of color or sensitivity. Intraoral examination showed class I molar relationship bilaterally, missing 11, over jet of 2mm, average overbite, highly placed maxillary canines in vestibule, cross bite irt 22 and 32 with moderate crowding in mandibular arch as well as an instanding 42.

Cephalometric analysis revealed an orthognathic maxilla and mandible, class I skeletal base with ANB of 3degree, average growth pattern with proclined upper and lower incisors (table 1).

**Skeletal**

Measurements	Pre treatment	Post treatment
SNA (°)	82	81.5
SNB (°)	79	79
ANB(°)	3	2.5
N Prep to pt. A (mm)	-2	-2
N prep to pog (mm)	-6	-6
Mandibular plane angle (°)	28	29

**CASE REPORT**

**Diagnosis and etiology-**

A 12-year-old pediatric patient was referred to the Department of Orthodontics and dentofacial orthopedics with the chief complaint of forwardly and irregularly placed upper front teeth (Figure 1). Dental history

**Dental**

U1 to NA ( $^{\circ}$ )	24	23
U1 to NA (mm)	4	3.5
L1 to NB ( $^{\circ}$ )	31	30
L1 to NB (mm)	5	5
L 1 to A pog (mm)	5	3
L1 to MP ( $^{\circ}$ )	103	101
Inter incisal angle ( $^{\circ}$ )	123	124

**Soft tissue**

'S' line (mm)		
Upper	1	0
Lower	4	3

**Table 1: Pre and post treatment cephalometric value**



**Figure 1: Pretreatment records**

**Treatment Objectives-**

The treatment objectives were as follows:

- 2) Achieve ideal alignment of upper and lower arch
- 2) Correction of proclination

- 3) Maintain class I molar relationship on both sides
- 4) Attain ideal dimensions of the mimic tooth.
- 5) Achieve an esthetic soft tissue profile

### Treatment Alternatives

1) The first option consisted of extraction of 14, 24, 34 and 44 followed by ideal alignment of upper and lower arch, maintained edentulous space till replacement of prosthetic implant or FPD irt 11

2) The second treatment option was extraction of 24, 34, and 44 and closing the edentulous space irt 11 by sequential converting of 12, 13, 14 into 11, 12, and 13 respectively, treatment mechanics also became challenging because of the asymmetric pattern of the extraction. Patient opted this option because of its conservative nature (14 extraction was avoided).

### Treatment progress

After extraction of 24, 34, 44, Pre-adjusted edgewise MBT prescription brackets (unitek™ Gemini metal bracket, 0.022- $\times$ 0.028-inch slot, 3M Unitek USA) were bonded in the maxillary and mandibular teeth. Leveling and alignment were initiated with

0.014-inch nickel titanium (Niti) arch wire followed by 0.014-inch stainless-steel (SS) arch wire. Anchorage in this stage was reinforced using lace backs and bend backs in both the arches and a transpalatal arch was used as anchorage device. Patient was progressively shifted to heavier arch wires 0.019  $\times$  0.025-inch stainless steel wires with crimpable retraction hooks to close the spaces. Class I force through active tie back (MBT) was used for retraction.

During retraction sufficient space was maintained in the first quadrant for converting 12 into 11 and other tooth respectively. After retraction, posterior settling was carried out with elastics (Figure 2). Duration of treatment was two-year three month. After removal of the fixed orthodontic appliances, the newly moved 12, 13, and 14 was recontoured for esthetics. Maxillary and mandibular retention was given with bonded canine-to canine fixed retainers.



Figure 2: Upper and lower: 0.014” Niti along with settling elastics.

### RESULTS

The soft tissue profile was pleasing. 12, 13, 14 was successfully reshaped to 11, 12, 13 respectively with an ideal overjet and overbite, coincident dental midlines with proper interdigitations of the posterior teeth were achieved. Cephalometric soft tissue values were improved and are given in table 1. The extraoral and intraoral photo graphs showed a stable occlusion and esthetic smile by orthodontic and esthetic treatment. (Figure 3)

### DISCUSSION

The objectives of the treatment were achieved. Class I canine relationship was achieved with ideal overjet and overbite. The panoramic radiograph showed a good root parallelism and

no signs of root resorption. Cephalometrically, all the values were within norms. The clinical examination of the masticatory muscles and temporomandibular joints did not show any pathological signs or symptoms at completion of treatment.

In this case report, we discussed various strategies for treating children who either have missing or avulsed maxillary central incisors. Missing permanent maxillary central incisors is a challenge in dentistry from an orthodontic perspective, there are usually two treatment options:

1. Maintain the space and restore the missing teeth, prosthetically.

2. Close the space orthodontically and restoratively modify the teeth that are

substituted.

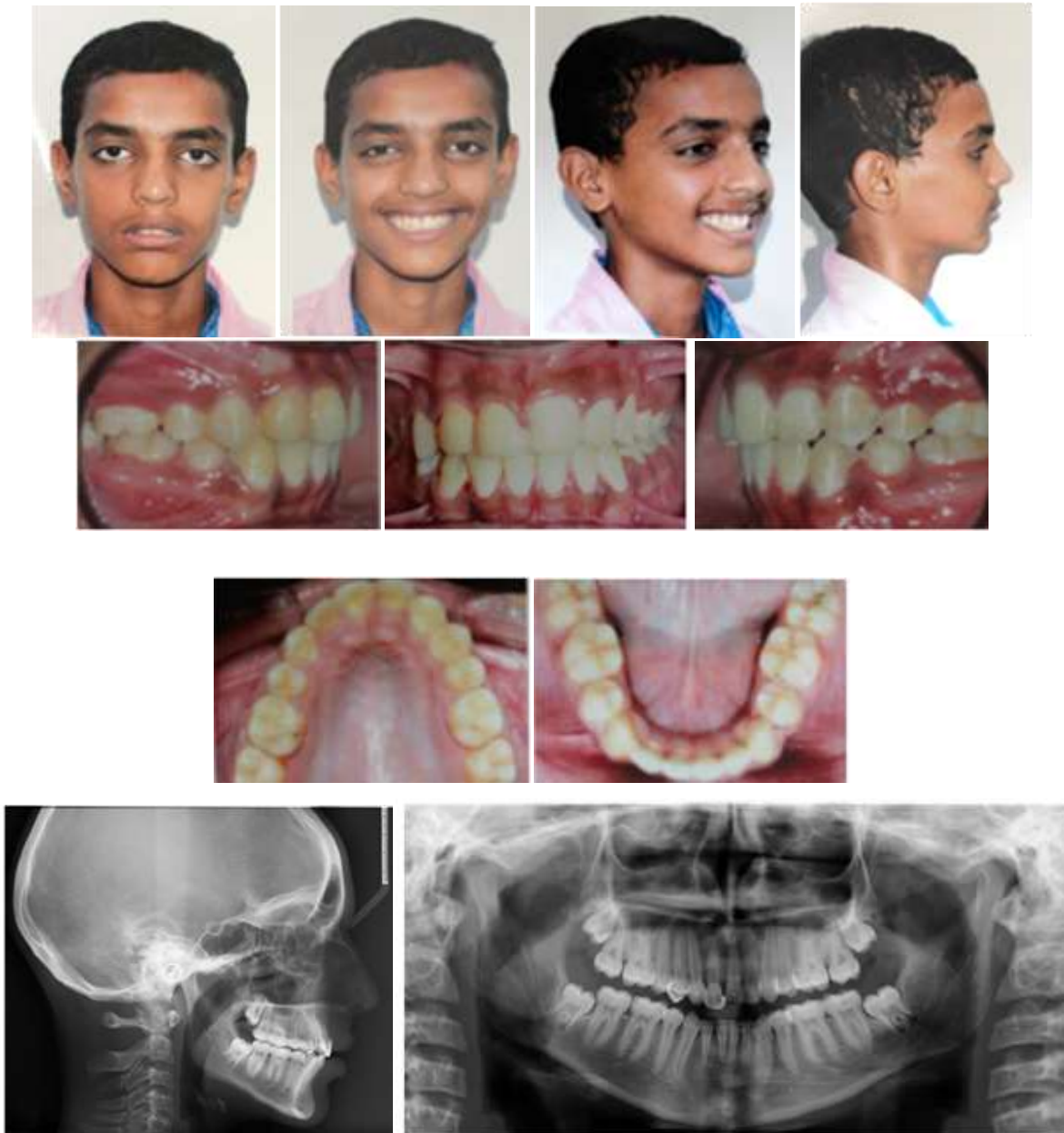


Figure -3: Post treatment records

With the space-closure alternative, a healthy gingival tissues and intact interdental gingival papillae will mature in synchronization with the patient's teeth, so that long-term modifications will appear naturally. Studies have shown that patients often prefer the space closure option because they consider it more conservative and desirable when compared to implants and prostheses.<sup>2,3</sup>

These are some clinical procedures which was applied in this case report to enhance the minor esthetic and orthodontic result.

**Gingival margin:** The gingival margin of the Maxillary central incisors and the canines should be symmetric and in a more apical position compared to those of the lateral incisors and the margin levels should be symmetric with the adjacent side. This levelling of the gingival margin can have obtained by orthodontic intrusion or extrusion.



It is usually necessary to intrude mesially substituted lateral incisors and first premolars, to align the gingiva and provide prosthetic space for optimizing crown morphology and the marginal gingiva, at the same time, this substituted canine may require extrusion and

crown reduction to achieve a gingival margin characteristic of a lateral incisor.

**Canine Shape:** The mesiodistal and the labiolingual dimension of the canine are wider than a lateral incisor, so a significant amount of crown reduction and prosthetic adjustments were carried out (figure 4)

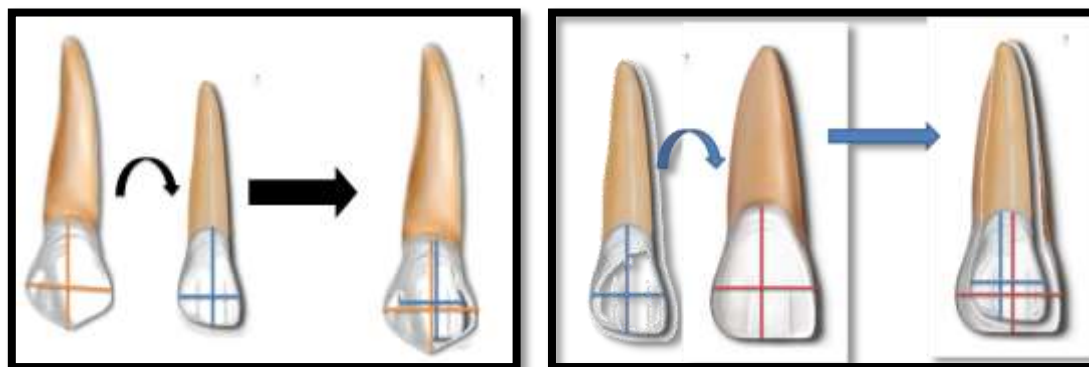


Figure 4- Comparing of mesiodistal, cervicoincisal width of maxillary central and lateral incisor along with canine increases the buccal crown torque. Thus, initially the first premolar bracket is used, after intrusion, the canine bracket can be used.<sup>4-13</sup>

**Root torque:** Attention to root torque must be given. The root prominence must be corrected before crown modification.

**Mesiodistal Position:** The mesial surface of the central incisor is flat when compared to the lateral incisor which is angulated. Hence, the lateral incisor should be well approximated along the midline, so as to provide a more natural esthetic appearance as well as more esthetic interdental papillae.

**Labio-Palatal Position:** in order to avoid trauma from occlusion, the lateral incisor should be placed slightly labially. This would prevent any jiggling forces on the tooth.

It is seen that the mesial surface of the premolar is highly prominent when compared to that of canine. This can be corrected by placing the bracket on the premolar more distally in order to mesially rotate it.

**Bracket Selection:** in order to obtain ideal tip, torque and rotation control, central incisor bracket should be placed on the substituted lateral incisor. When we use, the conventional canine bracket insufficient rotation is notice. Thus, it is preferred to use a lateral incisor bracket on the flattened surface of the canine. On the other hand, intrusion of the premolar

Finally, the patient should be committed to the final restorative and prosthetic procedures to achieve an optimal long-term result with respect to both esthetics and function.

#### Conclusions

In patients presenting with unilateral or bilateral missing maxillary central incisors, basically we have two treatments of choice either space maintenance and prosthetic replacement or space closure by protraction of adjacent teeth. The treatment plan should be conservative and patient should satisfy with functional demand and esthetic.

#### REFERENCES

1. Zachrisson BU, Stenvik A, Haanaes HR. Management of missing maxillary anterior teeth with emphasis on autotransplantation. Am J Orthod Dentofacial Orthop 2004;126:284-8.
2. Armbruster PC, Gardiner DM, Whitley Jr JB, Flerra J. The congenitally missing upper lateral incisor. Part 1: esthetic judgment of treatment options. World J Ortho 2005;6:369.

3. Armbruster PC, Gardiner DM, Whitley Jr JB, Flerra J. The congenitally missing upper lateral incisor. Part 2: assessing dentists' preferences for treatment. *World Ortho* 2005;6:376.
4. McCollum AG, Preston CB. Maxillary canineretraction, periodontal surgery, and relapse. *Am J Orthod* 1980;78:610-22.
5. Zachrisson BU. Improving orthodontic results in caseswith maxillary incisors missing. *Am J Orthod* 1978;73:274-89.
6. Romano R, Bichacho N, Touati B. The art of thesmile: integrating prosthodontics, orthodontics, periodontics,dental technology, and plastic surgery in esthetic dental treatment.*Quintessence Pub* 2005.
7. Kokich V, Nappen D, Shapiro P. Gingival contour and clinical crown length: their effects on the esthetic appearance of maxillary anterior teeth. *Am J Orthod Dentofacial Ortho* 1984;86:89-94.
8. Kokich V. Anterior dental esthetics: an orthodontic perspective I Crown length. *J Esthet Dent* 1993;5:19-23.
- 10.Kokich VG, Spear F. Guidelines for managing the orthodontic restorative patient. *Semin Orthod* 1997;3:3-20.
11. Kokich VG, Esthetics and vertical tooth position the orthodontic possibilities. *Compendium Cont Ed Dent* 1997;18:1225.
12. Kokich VG, Crabill KE. Managing the patient with missing or malformed maxillary central incisors. *Am J Orthod Dentofacial Orthop* 2006;129(4):S55–63.
13. Schwaninger B, Shaye R. Management of cases with upper incisor missing. *Am J Orthod Dentofacial Orthop* 1977;71:396-405.

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