

Orthodontic management of skeletal Class III malocclusion with congenitally missing maxillary lateral incisors: A case report

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Abstract

Congenitally missing maxillary lateral incisors present a significant esthetic and functional challenge requiring interdisciplinary treatment planning. This case report describes the orthodontic management of a 19-year-old female patient presenting with spacing in the upper anterior region, missing maxillary lateral incisors, and a skeletal Class III malocclusion with a protrusive mandible. Clinical examination, model analysis, and cephalometric evaluation revealed a Class III skeletal pattern, hypodivergent growth pattern, proclined maxillary incisors, and spacing in both maxillary and mandibular arches. A non-extraction orthodontic treatment approach was planned to align and level both arches, maintain Class I molar and canine relationships, achieve optimal overjet and overbite, and prepare the arches for prosthetic rehabilitation of the missing lateral incisors. The case highlights the importance of comprehensive diagnosis and interdisciplinary treatment planning in patients with congenitally missing teeth.

Keywords: Skeletal Class III malocclusion, congenitally missing lateral incisors, orthodontic treatment, spacing, interdisciplinary treatment, prosthetic rehabilitation

Introduction

Congenital absence of permanent teeth is one of the most common developmental anomalies encountered in dental practice. After third molars, maxillary lateral incisors are among the most frequently missing permanent teeth, with a reported prevalence ranging from 1% to 4% in different populations [1]. The absence of maxillary lateral incisors may result in esthetic concerns, spacing, altered occlusion, functional disturbances, and psychological impact on young patients [2].

Management of congenitally missing maxillary lateral incisors remains a challenge for orthodontists because treatment planning must consider facial esthetics, occlusal relationships, periodontal health, and long-term stability [3]. The two principal treatment approaches include orthodontic space closure with canine substitution or orthodontic space opening followed by prosthetic replacement [3, 4]. The choice depends on the patient's skeletal pattern, facial profile, smile characteristics, and occlusal requirements [5].

The presence of an associated skeletal discrepancy further complicates treatment planning. Interdisciplinary management involving orthodontists and prosthodontists is often required to achieve optimal esthetic and functional outcomes [3, 4]. The present case report describes the orthodontic management of a patient with skeletal Class III malocclusion and congenitally missing maxillary lateral incisors treated with orthodontic space management followed by prosthetic rehabilitation.

Patient Information

Chief Complaint

A 19-year-old female patient reported to the Department of Orthodontics with a chief complaint of spacing in the upper front teeth region.

The patient was concerned about the gap present in the upper front teeth region and desired improvement in her smile aesthetics.

Medical History

- No Relevant medical history
- No history of systemic illness
- No known drug allergies

Dental History

- Previous restorations with respect to teeth 16, 26, 27, 37, and 47
- Root canal treatment with respect to teeth 36 and 46 before 1 year

Personal and Social History

- No relevant habit history was reported.

Patient Perspective

The patient expressed dissatisfaction with the spacing in the anterior region and sought orthodontic treatment for improvement of dental appearance and smile aesthetics.

Clinical Findings

Extraoral Examination (Figure 1)



Fig 1: Extraoral Photographs- Front, Smile, Lateral, Side Profile

- Mesoprosopic facial form
- Bilaterally symmetrical face
- Concave profile
- Competent lips
- Obtuse nasolabial angle

- Prominent chin
- Flat smile arc

Intraoral Examination (Figure 2)



Fig 2: Intraoral Photographs

- Ovoid maxillary and mandibular arch forms
- Spacing present in maxillary and mandibular anterior regions
- Congenitally missing maxillary lateral incisors (12 and 22)
- Mesiobuccal rotation of tooth 14

- Class I molar relationship bilaterally
- Overjet: 0 mm
- Overbite: 0 mm

Diagnostic Assessment Radiographic Findings



Fig 3 A: Panoramic radiograph



Fig 3 B: Lateral cephalogram

Panoramic and cephalometric examination revealed:

- Skeletal Class III jaw relationship
- Protrusive mandible
- Normal maxilla
- Hypodivergent growth pattern
- Mild horizontal bone loss in mandibular anterior region
- Erupting third molars

Cephalometric Findings

- SNA: 80°
- SNB: 83°
- ANB: -3°
- Wits appraisal: -6.5 mm
- Beta angle: 38°
- Jarabak ratio: 67.29%

These findings confirmed a skeletal Class III relationship with mandibular prognathism and a hypodivergent growth pattern.

Diagnosis

Skeletal Diagnosis

- Skeletal Class III malocclusion
- Normal maxilla
- Protrusive mandible
- Hypodivergent growth pattern

Dental Diagnosis

- Angle's Class I malocclusion
- Congenitally missing maxillary lateral incisors [12, 22]
- Spacing in maxillary and mandibular anterior regions
- Mesio Buccal rotation of 14
- 0mm overjet and overbite

Soft Tissue Diagnosis

- Concave profile
- Obtuse nasolabial angle
- Protrusive lips
- Deep mentolabial sulcus

Therapeutic Intervention

Treatment Objectives

- Align and level both arches.
- Maintain Class I molar and canine relationships.
- Correct anterior spacing.
- Achieve ideal overjet and overbite.
- Derotate tooth 14.
- Establish proper space distribution for prosthetic replacement of teeth 12 and 22.
- Improve smile esthetics and soft tissue harmony.

Treatment Plan

- Non-extraction orthodontic treatment
- Alignment and leveling of maxillary and mandibular arches
- Space management for prosthetic rehabilitation
- Correction of overjet and overbite
- Prosthetic replacement of missing maxillary lateral incisors after orthodontic treatment

Follow-Up and Outcomes

The patient was informed regarding the treatment objectives, duration, limitations, and need for interdisciplinary management. Orthodontic treatment was initiated to achieve optimal alignment and create appropriate space for prosthetic rehabilitation.

Treatment Progress and Results

Fixed orthodontic treatment was carried out using a pre-adjusted edgewise appliance. Alignment and leveling were initiated with sequential nickel-titanium archwires and progressed to stainless steel archwires. During treatment, open coil springs were placed bilaterally on a 0.018-inch stainless steel archwire in the maxillary arch to regain and maintain adequate space for prosthetic replacement of the congenitally missing maxillary lateral incisors, 12 and 22 (Figure 4). In the mandibular arch, residual spacing was closed using sliding mechanics on a 0.018-inch stainless steel archwire with passive tie-back mechanics.

Progressive alignment and leveling resulted in correction of rotations, consolidation of mandibular spaces, and establishment of ideal space distribution in the maxillary arch. Class I molar relationship was maintained throughout treatment.



Fig 4: 9th month treatment progress

At the completion of orthodontic treatment, adequate space was achieved for prosthetic rehabilitation of teeth 12 and 22 (Figure 5,6). Improvement in dental alignment, smile

esthetics, and arch coordination was observed. Subsequently, prosthetic rehabilitation was carried out to replace the missing maxillary lateral incisors.



Fig 5: Post-orthodontic extraoral photographs



Fig 6: Post-orthodontic intraoral photographs

Post-treatment records demonstrated satisfactory alignment, maintenance of Class I molar and canine relationships, improved smile esthetics, and harmonious integration of the

prosthetic restorations with the natural dentition. The patient expressed satisfaction with both the functional and esthetic outcomes of treatment (Figure 7,8)



Fig 7: Post-prosthetic extraoral photographs



Fig 8: Post-prosthetic intraoral Photographs

Discussion

Congenital absence of the maxillary lateral incisors is one of the most frequently reported developmental dental anomalies encountered in orthodontic practice and may significantly affect dental esthetics, occlusal harmony, and overall smile attractiveness [1]. The absence of these teeth often results in spacing within the maxillary arch, altered canine relationships, and functional as well as esthetic concerns that require comprehensive diagnosis and treatment planning [1].

Management of congenitally missing maxillary lateral incisors remains a challenging aspect of orthodontic treatment because multiple treatment approaches may be considered depending on the patient's clinical presentation [2]. The two principal treatment strategies include orthodontic space closure with canine substitution and orthodontic space opening followed by prosthetic replacement [2]. Selection of the most appropriate treatment modality should be based on facial profile, skeletal pattern, occlusal relationship, periodontal status, available arch space, and patient expectations [5].

The present patient exhibited a skeletal Class III malocclusion characterized by mandibular prognathism and congenital absence of both maxillary lateral incisors [6]. Considering the existing occlusal relationships and the need for future prosthetic replacement of the missing teeth, orthodontic space opening was selected as the preferred treatment option [3]. Space creation was achieved using open-coil springs placed on a rigid stainless-steel archwire, allowing controlled development of adequate mesiodistal space for prosthetic rehabilitation [6]. Simultaneously, mandibular spacing was corrected using sliding mechanics to improve arch coordination and achieve a stable occlusal relationship [5].

Successful treatment of patients with congenitally missing maxillary lateral incisors often requires close collaboration between orthodontic and restorative disciplines [7]. Adequate space distribution and proper root positioning adjacent to the edentulous area are critical prerequisites for successful prosthetic rehabilitation [14]. Maintenance of adequate alveolar bone support during orthodontic treatment further contributes to long-term restorative success [11]. In the present case, sufficient space was established and favorable root parallelism was achieved before referral for prosthetic rehabilitation [3].

Previous studies have demonstrated that interdisciplinary management can provide predictable esthetic and functional outcomes in patients with congenitally missing maxillary lateral incisors [8]. Post-treatment evaluation in the present case revealed satisfactory alignment of both arches, maintenance of favorable molar and canine relationships, and adequate space preparation for prosthetic replacement of the missing teeth [9]. Improvement in smile esthetics and successful resolution of the patient's chief complaint further supported the effectiveness of the selected treatment approach [13]. The favorable outcome obtained emphasizes the importance of individualized treatment planning and interdisciplinary care in the management of patients with congenital absence of maxillary lateral incisors [12].

Clinical Significance

- Congenitally missing maxillary lateral incisors require comprehensive diagnosis and careful treatment planning [1].

- Treatment selection should be individualized according to skeletal pattern, facial profile, and restorative requirements [5].
- Orthodontic space opening provides a predictable approach when prosthetic replacement is planned [3].
- Proper root positioning and space distribution are essential for successful restorative outcomes [14].
- Interdisciplinary collaboration improves both esthetic and functional treatment results [7].
- Early diagnosis facilitates more predictable long-term management [15].

Conclusion

This case demonstrates the successful orthodontic management of congenitally missing maxillary lateral incisors in a patient with skeletal Class III malocclusion [6]. A non-extraction treatment approach involving orthodontic space opening effectively established functional occlusion, corrected spacing discrepancies, and created adequate space for future prosthetic rehabilitation [3]. Careful interdisciplinary treatment planning and coordination between orthodontic and restorative disciplines contributed to favorable esthetic and functional outcomes [7]. The findings highlight the importance of individualized treatment planning in achieving predictable long-term results for patients presenting with congenital absence of maxillary lateral incisors [12].

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