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Comprehensive Management of Spacing in the Maxillary Anterior Region with Congenitally Missing Lateral Incisors in a 12-Year-Old Child: A Case Report

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ABSTRACT

Hypodontia, defined as the congenital absence of one or more teeth (excluding third molars), is a common developmental anomaly with significant esthetic, functional, and psychosocial consequences, particularly when it involves the anterior region. The maxillary lateral incisors are among the most frequently missing teeth, and their absence during the mixed dentition stage requires comprehensive treatment planning. This case report describes the multidisciplinary management of a 12-year-old girl with congenitally missing maxillary right and left lateral incisors, associated with a high labial frenum attachment and tongue thrusting habit. The treatment protocol involved sequential steps of habit interception using myofunctional exercises followed by a fixed tongue guard appliance, frenectomy, orthodontic space creation with open coil springs, and interim prosthetic rehabilitation with a removable partial denture. This staged approach successfully restored function and esthetics, while also addressing the psychosocial needs of the patient. The case highlights the importance of early diagnosis and timely intervention in pediatric patients with hypodontia to establish a stable foundation for future definitive treatment.

Keywords: Hypodontia, Tongue thrusting habit, Frenectomy, Orthodontic space creation, Prosthetic rehabilitation

INTRODUCTION

Hypodontia refers to the congenital absence of one or more teeth, excluding the third molars.[1] It is one of the most common developmental anomalies of the dentition and is classified as a type of tooth agenesis, in which a tooth fails to develop. Related terms include oligodontia, denoting the absence of six or more teeth, and anodontia, which indicates complete absence of teeth. However, the term hypodontia is most widely accepted, as it encompasses cases with varying numbers of missing teeth. Based on severity, it can be categorized as mild (absence of 1–2 teeth), moderate (absence of 2–5 teeth), or severe (absence of six or more teeth). [2,3]

Hypodontia may involve either the primary or permanent dentition and presents significant clinical challenges, often requiring comprehensive treatment planning. It can affect facial esthetics, speech development, and masticatory efficiency, while also exerting a negative

influence on social and emotional well-being. Children and adolescents are particularly vulnerable to these consequences, making early diagnosis and intervention essential to minimize both functional and psychological impacts.[4]

The reported prevalence of hypodontia varies across populations, ranging between 2.6% and 11.3%, with an overall global prevalence of approximately 6.4%. A higher frequency is consistently observed in females compared to males.[5] The etiology is multifactorial, with genetic, epigenetic, and environmental factors contributing to its occurrence. [5,6]

During the mixed dentition stage, pediatric dentists play a critical role in preserving the remaining dentition, maintaining occlusal function, improving esthetics and speech, and supporting the psychosocial well-being of affected children. At this stage, management often involves providing interim prosthetic and orthodontic solutions that restore function and appearance until growth is complete, when definitive options such as implants or implant-supported prostheses can be considered.[7]

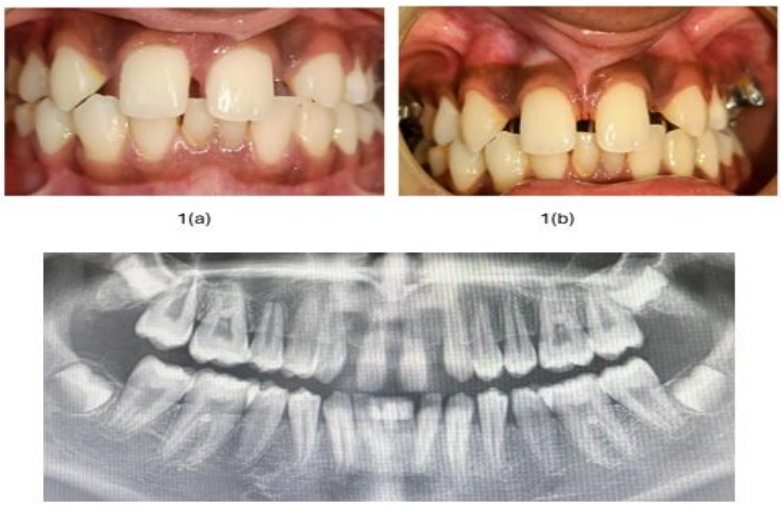
This case report presents the comprehensive management of a 12-year-old girl with congenitally missing maxillary right and left lateral incisors, complicated by a high labial frenum attachment and tongue thrusting habit. The treatment plan focused on habit interception, frenectomy, orthodontic space creation, and interim prosthetic rehabilitation, thereby addressing both esthetic and functional concerns at an early age.

CASE REPORT

A 12-year-old girl reported to the Department of Pediatric and Preventive Dentistry, with the chief complaint of spacing in the upper front teeth. The patient's medical history was non-contributory, and no relevant family history of missing teeth was reported.

Clinical examination: Extraoral examination revealed no significant findings. Intraoral examination revealed spacing in the maxillary anterior region with the congenital absence of both maxillary right and left permanent lateral incisors. A high labial frenum attachment of the papilla penetrating type (Placek classification) was noted,[8] and the patient exhibited a tongue thrusting habit [Figure 1(a,b)].

Radiographic examination: An orthopantomogram (OPG) confirmed the absence of the maxillary permanent lateral incisors and showed no evidence of impaction or other associated anomalies [Figure 1 (c)].



1(a) 1(b)

1 (c)

Figure 1. (a) Spacing between the maxillary anterior teeth. (b) High-attached maxillary labial frenum.(c) Orthopantomogram showing congenitally missing maxillary right and left lateral incisors.

Diagnosis: Hypodontia involving the maxillary right and left permanent lateral incisors, associated with a high labial frenum and tongue thrusting habit.

Treatment plan:
The treatment plan included interception and correction of the tongue thrusting habit using myofunctional exercises followed by a fixed tongue guard appliance, frenectomy to address the high labial frenum, orthodontic space creation for the replacement of the missing maxillary lateral incisors, and interim prosthetic rehabilitation.

Treatment provided:
Myofunctional exercises were initiated to intercept the tongue thrusting habit and improve tongue posture. This was followed by the placement of a fixed tongue guard appliance using molar bands and buccal tubes to reinforce habit correction [Figure 3]. A fixed tongue guard appliance was fabricated and placed using molar bands and buccal tubes to intercept the tongue-thrusting habit [Figure 2].

Figure 2. fixed tongue guard appliance.

After three months of successful habit control, a frenectomy was performed to release the high labial frenum attachment [Figure 3 (a-c)].

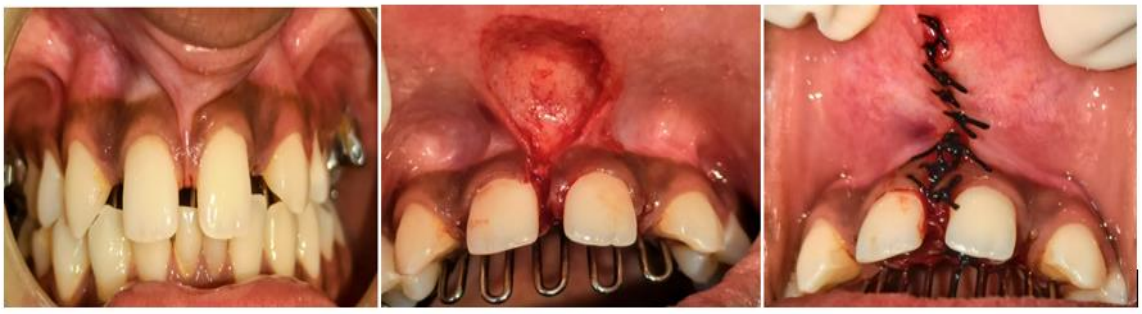


Figure 3. Frenectomy procedure: (a) Preoperative view showing high-attached maxillary labial frenum. (b) Intraoperative view following frenectomy. (c) Immediate postoperative view with sutures in place.

Subsequently, fixed orthodontic therapy was initiated using MBT brackets bonded to the maxillary teeth. Initial alignment was started with a 0.014" NiTi archwire, followed by 0.016" NiTi and 0.018" NiTi archwires, with passive lacebacks and bend-backs for anchorage control and consolidation of the maxillary central incisors. Progression to a 0.018" stainless steel archwire was carried out, and nickel–titanium open coil springs were placed in the regions of the maxillary lateral incisors to create adequate space [Figure 4 (a-c)].

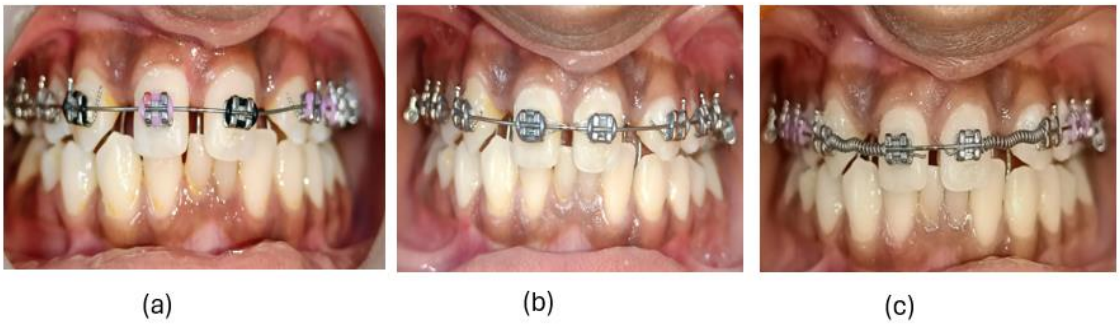


Figure 4. Orthodontic treatment progress: (a) Placement of 0.014" NiTi archwire. (b) Placement of 0.016" NiTi archwire with laceback and anterior consolidation. (c) Placement of NiTi open-coil spring over 0.018" stainless steel (SS) archwire.

Once sufficient space was obtained, interim esthetic rehabilitation was achieved with a removable partial denture to replace the missing lateral incisors [Figure 5 (a-c)].

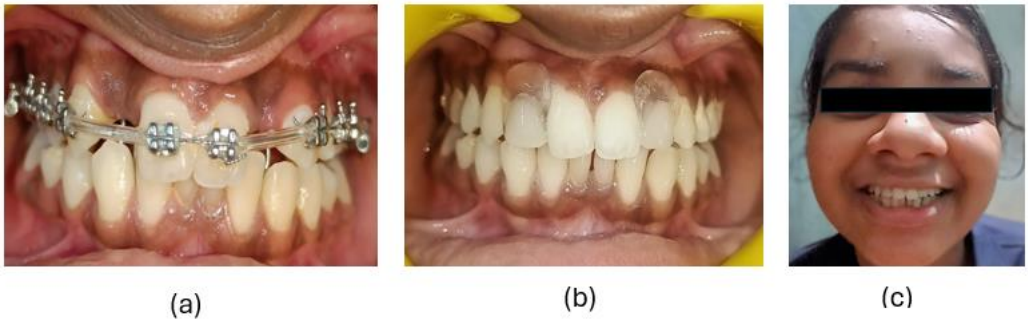


Figure 5. Interim esthetic rehabilitation: (a) Space creation for lateral incisors. (b) Removable partial denture in place to replace the missing lateral incisors. (c) Post-rehabilitation extraoral smiling view showing improved esthetics.

Follow-up and outcome:

The patient was reviewed periodically, and satisfactory results were achieved both esthetically and functionally. The child and parents were motivated and cooperative throughout treatment. Long-term planning includes consideration of definitive prosthetic options, such as implant-supported restorations, once growth is complete.

DISCUSSION

Congenital absence of maxillary lateral incisors is a relatively common presentation of hypodontia and has significant implications for both esthetics and function. The reported prevalence of hypodontia varies between populations, with maxillary lateral incisors being the second most frequently missing teeth after mandibular second premolars.[1,2] In the present case, the agenesis of both maxillary lateral incisors was complicated by a high labial frenum and tongue thrusting habit, which further contributed to spacing in the anterior region.

The etiology of hypodontia is multifactorial, involving genetic and environmental influences.[3] Previous studies have highlighted that females are more commonly affected than males, which was consistent with the current case.[4] The recognition of a genetic basis for tooth agenesis marked a significant shift in understanding its etiology. Early research demonstrated that hypodontia follows an autosomal dominant inheritance pattern, though with variable expression and incomplete penetrance. Later, Brook emphasized the influence of sex differences on tooth number and size. He reported that hypodontia and microdontia occur more

frequently in females, whereas males tend to present with supernumerary teeth and larger tooth dimensions.[9]

Early identification and intervention are important, particularly during the mixed dentition stage, to minimize adverse effects on speech, mastication, and psychosocial well-being. [5,6]

Management of congenitally missing maxillary lateral incisors can be broadly categorized into two approaches: orthodontic space closure with canine substitution, or orthodontic space opening followed by prosthetic replacement. In space closure with canine substitution, the maxillary canines are orthodontically moved into the lateral incisor positions and reshaped to mimic lateral incisors, while the first premolars take over the canine role in occlusion. This approach eliminates the need for prosthetic teeth and is often preferred in cases with crowding, Class II malocclusion tendency, or favorable canine morphology.[10] The choice of treatment depends on several factors including occlusion, facial esthetics, growth status, and patient/parental preferences. In growing children, interim prosthetic replacement is generally recommended until definitive options such as implants can be considered after growth completion.[11]

In the present case, a stepwise and comprehensive approach was adopted. Myofunctional exercises were initially implemented to intercept the tongue thrusting habit and improve tongue posture, followed by the use of a fixed tongue guard appliance for habit correction, as untreated habits may compromise orthodontic outcomes and contribute to relapse. A frenectomy was subsequently performed to correct the high labial frenum, which has been shown to be a significant etiological factor in maintaining a midline diastema.[12] Orthodontic therapy with NiTi open coil springs was then used to create space for the lateral incisors, followed by interim prosthetic replacement with a removable partial denture. This approach effectively restored function and esthetics, while also providing a temporary solution until definitive treatment can be planned in adulthood.

Thus, the management strategy in this case aligns with recommendations in the literature, emphasizing early habit correction, surgical intervention when indicated, space management, and provisional prosthetic rehabilitation to address both functional and psychological needs of the patient.

CONCLUSION

Early diagnosis and timely intervention play a vital role in the successful management of hypodontia, particularly when it involves the maxillary anterior region. In the present case, a comprehensive approach that included habit interception, frenectomy, orthodontic space management, and interim prosthetic rehabilitation helped restore both function and esthetics while addressing the child's psychological needs. This staged management provides a foundation for future definitive treatment options once growth is complete, ensuring long-term stability and improved quality of life for the patient.

Declaration by Authors

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