

Orthodontic Considerations in a Rare Case of Mandibular Anterior and maxillary lateral tooth Agenesis with Midline Canine Eruption and Retained Deciduous Canines: A Case Report

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DOI: <https://doi.org/10.52403/ijrr.20260309>

ABSTRACT

Congenital absence of permanent mandibular incisors is uncommon, and its association with ectopic eruption of mandibular canines and retention of deciduous canines presents a rare clinical scenario. This case report describes a patient with agenesis of permanent mandibular central and lateral incisors, permanent mandibular canines positioned in the anterior midline region, and retained deciduous canines distal to them. The case posed significant challenges in diagnosis, space management, and treatment planning. An individualized orthodontic approach was adopted to achieve functional occlusion and acceptable esthetics. This report highlights the importance of early diagnosis and tailored treatment strategies in managing complex patterns of dental agenesis.

Keywords: Dental agenesis, midline canine eruption, retained deciduous canines

INTRODUCTION

Dental agenesis is one of the most common developmental anomalies of the dentition.^{1,2,3} However, agenesis involving the permanent mandibular incisors is relatively rare.⁴ Such cases are often associated with disturbances in eruption patterns of adjacent teeth, including ectopic positioning of canines and prolonged retention of deciduous teeth.^{3,4} The absence of mandibular incisors significantly affects anterior guidance, occlusal function, and smile esthetics, thereby complicating orthodontic management. This case report presents a rare clinical presentation of mandibular anterior tooth agenesis with permanent canines erupting in the midline and retained deciduous canines positioned distally.

CASE REPORT

Patient History and Chief Complaint

The patient reported to the Department of Orthodontics with the chief complaint of missing lower front teeth and dissatisfaction with dental appearance due to spacing in upper anteriors.

The patient expressed concern regarding the absence of mandibular anterior teeth and the irregular position of the lower canine teeth.

Extraoral Examination

Extraoral examination revealed no gross facial asymmetry. The facial profile and lip posture were influenced by the absence of mandibular anterior dental support.

Intraoral Examination

Intraoral examination revealed the following findings:

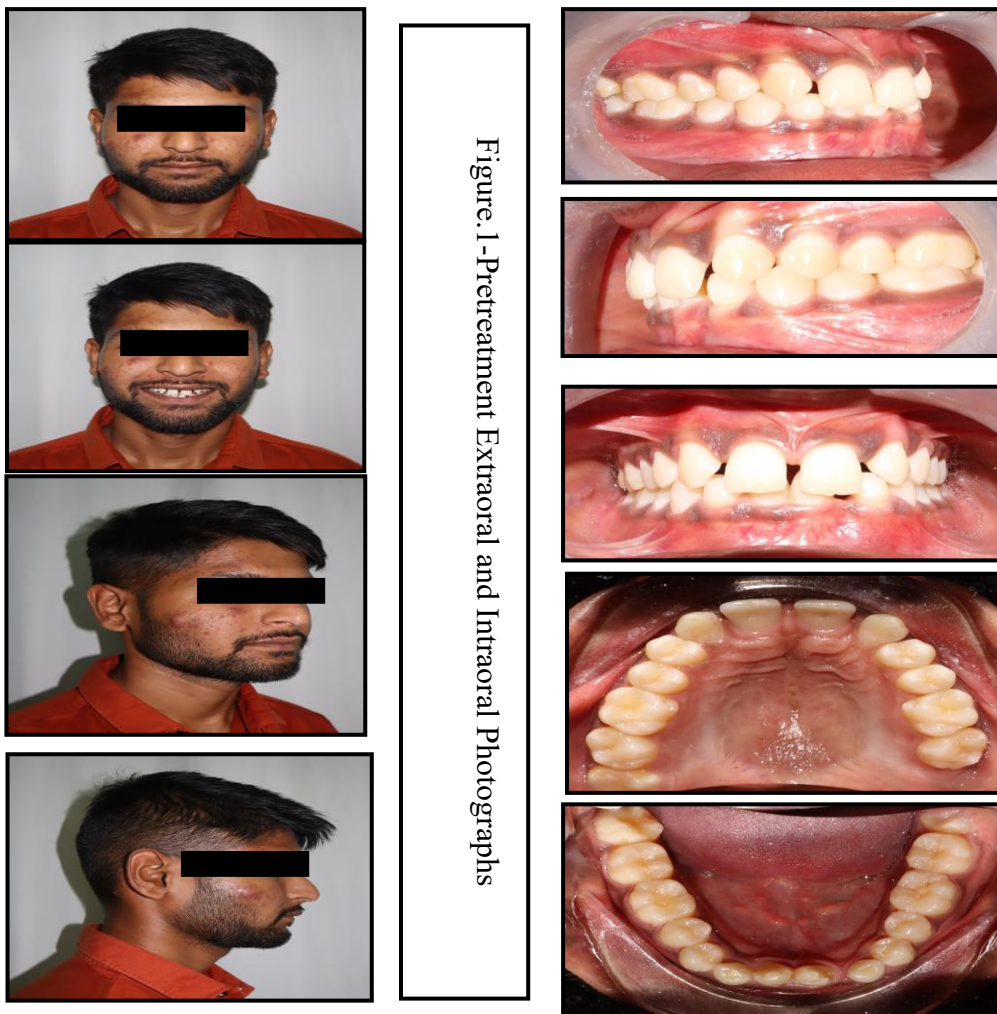
- Congenital absence of permanent mandibular central and lateral incisors
- Presence of permanent mandibular canines positioned in the anterior midline region
- Retained deciduous mandibular canines located distal to the permanent canines.

- Congenital absence of permanent maxillary lateral incisors.
- Altered mandibular anterior tooth sequence.
- Compromised anterior aesthetics and guidance.

The maxillary arch showed absence of permanent lateral incisors, further contributing to anterior esthetic concerns.

Radiographic Examination

Panoramic radiographic evaluation confirmed the congenital absence of permanent mandibular central and lateral incisors, as well as missing permanent maxillary lateral incisors. Permanent mandibular canines were observed in a mesial position relative to their normal eruption path. Retained deciduous canines were present distal to the permanent canines, with no associated pathological findings.



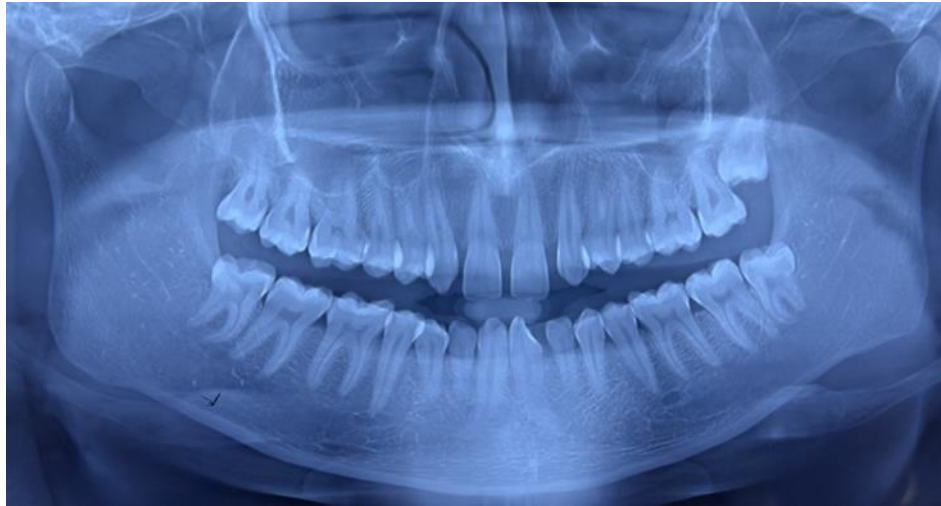


Figure 2. Pretreatment panoramic radiograph showing congenital absence of permanent mandibular central and lateral incisors and maxillary lateral incisors, ectopic mesial positioning of permanent mandibular canines in the anterior region, and retained deciduous mandibular canines distal to the permanent canines. No associated pathological changes were observed.

Diagnosis

Based on clinical and radiographic findings, the diagnosis was:

- Congenital agenesis of permanent mandibular central and lateral incisors
- Agenesis of permanent maxillary lateral incisors
- Ectopic eruption of permanent mandibular canines in the anterior region
- Retained deciduous mandibular canines
- Compromised anterior esthetics and function.

Treatment Objectives

1. Establish functional mandibular anterior occlusion
2. Manage space resulting from missing mandibular incisors

3. Correct the position of permanent mandibular canines
4. Preserve or extract deciduous canines based on prognosis
5. Improve anterior esthetics and occlusal stability

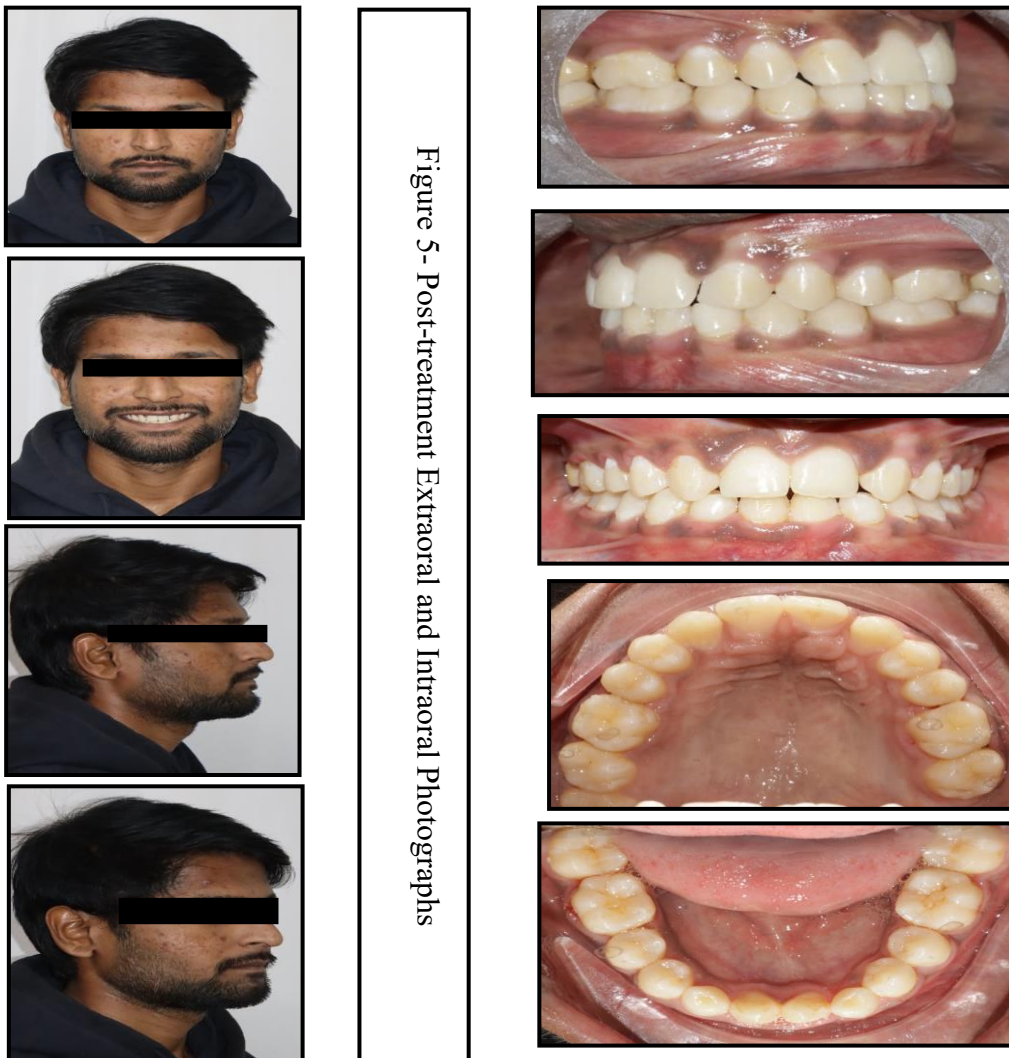
After initial leveling and alignment, an intrusion utility arch was incorporated in the mandibular arch to address the vertical discrepancy and control the deep curve of Spee. The appliance was designed to deliver light, continuous intrusive forces to the anterior segment while maintaining posterior anchorage. This approach facilitated controlled intrusion of the anterior teeth without undesirable extrusion of posterior teeth or loss of anchorage.^{5,6}



Figure 3- An intrusion utility arch was incorporated to achieve controlled intrusion of the anterior segment (A)Passive phase of utility arch (B)Active phase of utility arch



Figure 4 -Post-treatment radiographic evaluation demonstrated stable tooth positions and satisfactory occlusal relationships



Treatment Considerations

Given the complexity of the dental anomalies, treatment options considered included:

- Orthodontic space closure with canine substitution
- Space maintenance for future prosthetic replacement

- Retention of deciduous canines as long-term space maintainers

The final treatment approach was individualized based on occlusal requirements, periodontal considerations, and long-term prognosis.

RESULT

All planned treatment procedures were completed without any complications, and the patient demonstrated good compliance throughout the treatment period. Clinical evaluation revealed satisfactory alignment of the dental arches with improvement in anterior esthetics and occlusal relationships. Following orthodontic intervention, the mandibular arch exhibited improved anterior occlusal function despite the absence of permanent mandibular incisors. The permanent mandibular canines, initially positioned in the anterior midline region, were brought into a more favorable alignment, contributing to improved functional guidance. The retained deciduous mandibular canines remained periodontally stable and functionally acceptable at the end of treatment.

Use of the intrusion utility arch resulted in effective vertical control of the mandibular anterior segment. A clinically appreciable reduction in the curve of Spee was observed, without evidence of undesirable posterior extrusion. Anterior intrusion was achieved in a controlled manner, contributing to improved occlusal interdigitation and functional stability.

Radiographic evaluation corroborated the clinical findings. Pretreatment panoramic radiographs confirmed agenesis of the permanent mandibular central and lateral incisors and maxillary lateral incisors, along with ectopic positioning of the permanent mandibular canines and retention of deciduous canines. Post-treatment panoramic radiographs demonstrated stable tooth positions, satisfactory root parallelism, and absence of pathological changes.

Cephalometric assessment revealed maintenance of overall skeletal relationships with no adverse vertical changes. Post-

treatment lateral cephalogram confirmed controlled intrusion of the anterior segment and preservation of posterior vertical dimension following the use of the intrusion utility arch.

Overall, the treatment resulted in improved occlusal function, acceptable dental esthetics, and stable periodontal and radiographic outcomes.

DISCUSSION

Dental agenesis involving the permanent mandibular incisors is an uncommon developmental anomaly, and its association with ectopic eruption of permanent mandibular canines and retention of deciduous canines represents a rare and complex clinical presentation. The absence of mandibular central and lateral incisors disrupts the normal eruption sequence and alters the spatial guidance for adjacent teeth, often resulting in mesial migration or ectopic positioning of the permanent canines. In the present case, the permanent mandibular canines erupted in the anterior midline region, while the deciduous canines were retained distal to them, reflecting a significant disturbance in anterior arch development.

The etiology of such patterns is likely multifactorial, involving genetic influences, localized developmental disturbances, and altered eruption guidance due to the absence of permanent incisors.^{2,3} Previous studies have suggested that agenesis of anterior teeth may lead to compensatory changes in arch form and eruption paths of neighboring teeth. The retention of deciduous canines in this case may be attributed to the absence of eruptive pressure from their permanent successors, allowing them to persist beyond the expected exfoliation period. When periodontal support and root structure are favorable, retained deciduous teeth may function effectively as space maintainers and contribute to occlusal stability.⁷

From a functional standpoint, the absence of mandibular incisors significantly compromises anterior guidance, which plays a critical role in disclusion of posterior teeth

during mandibular excursions^{8,9}. In such cases, orthodontic management must aim not only to achieve acceptable alignment but also to re-establish functional occlusal relationships that minimize excessive posterior loading. The ectopic positioning of permanent canines further complicates anterior guidance, as canines are anatomically designed to withstand lateral functional forces. Careful repositioning or strategic utilization of canines is therefore essential to restore functional occlusion.

Treatment planning in cases of mandibular anterior agenesis requires a thorough evaluation of multiple factors, including space availability, periodontal health, facial esthetics, occlusal relationships, and long-term restorative considerations.¹⁰ Available treatment options include orthodontic space closure with canine substitution, maintenance of spaces for future prosthetic replacement, or a combination of orthodontic and restorative approaches. In the present case, individualized treatment planning was emphasized to balance functional requirements with esthetic outcomes while preserving existing dentition.

The management of retained deciduous canines remains a subject of clinical debate. While extraction may be indicated in cases of advanced root resorption or periodontal compromise, long-term retention can be a viable option when the teeth exhibit favorable crown–root morphology and periodontal health. Retaining deciduous canines may reduce the need for extensive orthodontic space redistribution and delay or eliminate the need for prosthetic intervention, particularly in younger patients.¹¹

Another important consideration in such cases is the long-term stability of the achieved occlusion. Altered tooth size–arch length relationships and atypical tooth sequencing may predispose to relapse if not adequately addressed. Therefore, careful finishing, establishment of stable intercuspation, and appropriate retention protocols are essential to ensure long-term success. Additionally, patients should be

informed about the possibility of future restorative or prosthetic treatment as part of a comprehensive, phased treatment approach.

Overall, this case underscores the importance of early diagnosis and comprehensive assessment in patients presenting with dental agenesis and eruption disturbances. Three-dimensional evaluation of tooth position, eruption pattern, and occlusal function is crucial for formulating an effective treatment plan. An interdisciplinary approach involving orthodontics and restorative dentistry may further enhance treatment outcomes in complex agenesis cases.

CONCLUSION

This case report describes a rare dental anomaly characterized by mandibular anterior tooth agenesis with permanent canines positioned in the midline and retained deciduous canines distally. Successful management requires careful evaluation of eruption patterns, space requirements, and long-term treatment.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: No conflicts of interest declared.

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How to cite this article: Shubhangi Mani, N.G. Toshniwal, Abhishek Agale, Apoorva Tonde. Orthodontic considerations in a rare case of mandibular anterior and maxillary lateral tooth agenesis with midline canine eruption and retained deciduous canines: a case report. *International Journal of Research and Review.* 2026; 13(3): 73-79. DOI: <https://doi.org/10.52403/ijrr.20260309>
