



## Multidisciplinary Treatment of Oligodontia: Orthodontic, Periodontal, and Restorative Approach: A Case Report

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Case Report

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### ABSTRACT

This case report describes a multidisciplinary approach to treating a 12-year-old female with oligodontia, presenting with congenital absence of maxillary lateral incisors, maxillary second premolars, and mandibular premolars. The patient exhibited generalized diastemas, bilateral Angle Class III molar relationships, and a skeletal Class II pattern. Treatment consisted of 36-month orthodontic therapy to position maxillary canines in lateral incisor positions, soft tissue procedures including frenectomy and gingivectomy to improve gingival symmetry, and esthetic rehabilitation with direct composite laminate veneers. Maxillary second primary molars were retained as space maintainers despite radiographic root resorption. Post-treatment results showed successful space closure and improved esthetics with clear removable retainers provided for retention. This case report presents how a multidisciplinary approach integrating orthodontic space management, soft tissue recontouring, and minimally invasive restorations can facilitate functional and esthetic treatment planning in oligodontia cases.

**Keywords:** Oligodontia, Multidisciplinary treatment, Direct composite veneers

## Oligodontinin Multidisipliner Tedavisi: Ortodontik, Periodontal ve Restoratif Yaklaşım: Olgu Sunumu

### Olgu Sunumu

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### ÖZET

Bu olgu sunumu, bilateral maksiller lateral kesici dişler, maksiller ikinci premolarlar ve mandibular premolarların konjenital olarak eksik olduğu 12 yaşında kadın bir oligodonti hastasının tedavisinde uygulanan multidisipliner yaklaşımı tanımlamaktadır. Hastada yaygın diastemalar, bilateral Angle Sınıf III molar ilişkisi ve iskeletsel Sınıf II patern saptanmıştır. Tedavi kapsamında, maksiller kaninlerin lateral diş pozisyonuna yerleştirilmesini içeren 36 aylık ortodontik tedavi, gingival simetriyi sağlamak amacıyla yapılan frenektomi ve gingivektomi işlemleri, ve direkt kompozit lamina restorasyonları ile estetik rehabilitasyon gerçekleştirilmiştir. Maksiller ikinci süt azı dişlerinde radyografik olarak kök rezorpsiyonu gözlenmesine rağmen, mobilite bulunmadığı için bu dişler yer tutucu olarak ağızda tutulmuştur. Tedavi sonunda boşluklar başarıyla kapatılmış, estetik açıdan tatmin edici sonuçlar elde edilmiş ve retansiyon amacıyla şeffaf hareketli plaklar verilmiştir. Bu olgu, ortodontik boşluk yönetimi, yumuşak doku şekillendirme ve minimal invaziv restorasyonları içeren multidisipliner yaklaşımın, oligodonti olgularında fonksiyonel ve estetik açıdan etkin bir tedavi planlamasını mümkün kıldığını göstermektedir.

**Anahtar Kelimeler:** Oligodonti, Multidisipliner tedavi, Direkt kompozit veneer

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## Introduction

Dental anomalies are generally classified into four main categories: anomalies of number, shape, size, and tissue structure.<sup>1</sup> Among numerical anomalies, hypodontia, oligodontia, and anodontia are the most frequently observed types. Hypodontia refers to the congenital absence of one or more teeth, oligodontia is defined as the absence of six or more teeth, and anodontia indicates the complete absence of all teeth.<sup>2,3</sup> The most commonly missing teeth are the maxillary and mandibular third molars, maxillary lateral incisors, and mandibular second premolars.<sup>4</sup> Oligodontia is seen in approximately 0.3% of the general population in the permanent dentition, with a similar prevalence reported in the Turkish population.<sup>3</sup>

Congenital multiple tooth agenesis can reduce masticatory efficiency and, particularly when it affects the anterior region, may lead to speech impairments and reduced self-confidence. Addressing these challenges often requires a multidisciplinary treatment approach. During orthodontic treatment, existing spaces can be closed, or spaces can be opened to accommodate future restorative or prosthetic procedures. In addition to orthodontic alignment, reshaping the soft tissue contours prior to the final restorative stage significantly contributes to achieving optimal esthetic results.<sup>5</sup>

## Case Presentation

A 12-year-old female patient with no systemic disease presented to our clinic with the chief complaint of spacing between her teeth. Clinical examination revealed that these spaces were due to congenital tooth agenesis. Oral examination showed generalized diastemas and a prominent labial frenum attachment. Intraoral assessment revealed bilateral Angle Class III molar relationships and a 1 mm midline shift to the right. No mobility was observed in the maxillary second primary molars. Extraoral examination revealed a convex facial profile (Figure 1).

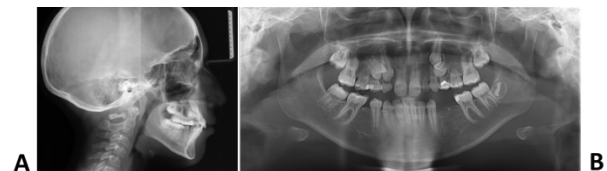
Panoramic radiographic evaluation revealed congenital absence of the maxillary second premolars and lateral incisors, as well as the mandibular second premolars and the left mandibular first premolar. Except for the left third molar,

no other third molar germs were detected. Cephalometric analysis showed bimaxillary retrognathia, a skeletal Class II relationship, and a normodivergent facial pattern (Figure 2). Model analysis revealed an overjet of 4 mm and an overbite of 3 mm. Space analysis indicated 5 mm of excess space in the maxilla and 17 mm in the mandible.

The patient and her legal guardian were fully informed about the procedures and provided written informed consent for the publication of this case report and related clinical images.



**Figure 1.** A, B, C; pre-treatment extraoral photographs. D, E, F, G, H; pre-treatment intraoral photographs.



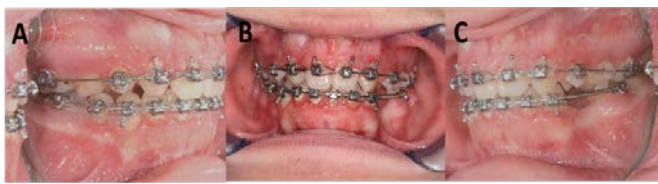
**Figure 2.** A, pre-treatment cephalometric radiograph. B, pre-treatment panoramic radiograph

**Table 1.** Mutations and enzyme defects in Disorders of Sexual Development.

Measurements	Pre-treatment (T0)	Post-treatment (T1)
SNA	81.34°	81,90°
SNB	75.80°	76,58°
ANB	5.54°	5,32°
1-NA	3.07 mm / 21°	2.04 mm / 17°
1-NB	7,58 mm / 28°	3,88 mm / 20°
Overjet	3,93 mm	4,26 mm
Overbite	3,06 mm	3,11 mm

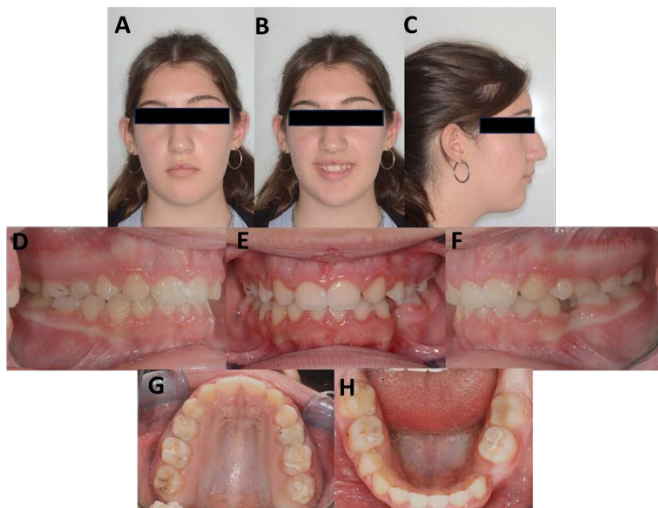
WNT4, In the treatment plan, since the maxillary second primary molars showed no signs of mobility, they were retained as space maintainers. In the mandible, the plan was to close the existing spaces to achieve an ideal molar relationship. Considering the absence of maxillary lateral incisors, the permanent canines were planned to be moved into the lateral incisor positions. To support soft tissue esthetics, frenectomy and gingivectomy procedures were planned after orthodontic treatment.

During orthodontic treatment, 0.018-inch slot Roth brackets were used. Leveling and alignment were performed using 0.014 and 0.016-inch nickel-titanium archwires, followed by 0.016 × 0.016 and 0.016 × 0.022-inch stainless steel archwires (Figure 3). The impacted maxillary left canine was surgically exposed and brought into alignment using a closed-flap technique.



**Figure 3.** A, B, C: intra-treatment intraoral photographs.

The total duration of orthodontic treatment was 36 months. At the end of treatment, the maxillary spaces were completely closed. In the mandibular arch, a single implant site was preserved due to the bilateral premolar agenesis on the left side (Figure 4). Post-treatment panoramic radiography revealed root resorption in the maxillary second primary molars; however, since no clinical mobility was observed, these teeth were retained as functional space maintainers. No resorption was detected in the other permanent teeth. Since no orthopedic treatment was applied, the skeletal Class II relationship persisted at the end of treatment (Figure 5). Final model analysis showed an overjet of 3.5 mm and an overbite of 4 mm. The cephalometric and clinical changes observed before and after treatment are summarized in Table 1.



**Figure 4.** A, B, C: post-treatment extraoral photographs. D, E, F, G, H: post-treatment intraoral photographs.



**Figure 5.** A, post-treatment cephalometric radiograph; B, post-treatment panoramic radiograph.

After orthodontic treatment, a frenectomy was performed due to a thick labial frenum attachment at the maxillary midline. This was followed by localized gingivectomy procedures to improve gingival symmetry in the esthetic zone. All periodontal procedures were performed under local anesthesia (0.5 ml). The frenectomy site was sutured with non-resorbable silk sutures, which were removed after one week. After complete healing of the soft tissues, restorative procedures were initiated.

Direct composite laminate veneers were completed in a single session. For the restorations, Tokuyama Estelite Asteria A2B (body) for dentin shade and NE (enamel) for enamel shade were used. In areas requiring increased opacity, Tokuyama Omnicroma Blocker was applied for substructure masking. The palatal shell was created using the NE shade due to its translucent nature. GC G-Premio Bond Universal adhesive system was used for bonding, and polishing was performed with EVE composite polishing spirals (Figure 6). At the end of treatment, clear removable retainers were delivered for both arches to ensure long-term retention. Follow-up examinations revealed that the patient was satisfied with the outcome, and both functional and esthetic results were successfully achieved.



**Figure 6.** A, intraoral photograph following frenectomy and gingivectomy procedures. B, intraoral photograph following completion of restorative treatment.

## Discussion

Congenital tooth agenesis is one of the most frequently encountered developmental anomalies in dentistry. While genetic factors are considered the primary cause, environmental influences may also play a role in its etiology. In patients with oligodontia, esthetic, functional, and phonetic concerns often coexist, necessitating a multidisciplinary treatment approach.<sup>6</sup>

In this case, due to the absence of the maxillary lateral incisors in the anterior region, the permanent canines

were orthodontically positioned in the lateral incisor space. This was considered in the restorative planning, and esthetic harmony was achieved with direct composite laminates. Rosa and Zachrisson emphasized that in young patients with missing lateral incisors, orthodontic space closure with canine substitution can provide satisfactory esthetic and functional outcomes.<sup>7</sup> However, for optimal results, such approaches must be supported with proper soft tissue recontouring.

Kokich stated that symmetrical and healthy gingival tissues are essential for achieving an ideal smile esthetic, especially in the anterior region. In this case, frenectomy and localized gingivectomy procedures performed after orthodontic treatment improved the gingival profile and contributed significantly to the esthetic outcome of the composite laminates.<sup>8</sup>

Direct composite laminates are a conservative and widely preferred option, especially in young patients. Their minimally invasive nature, single-session applicability, and reversibility make them advantageous for both clinicians and patients. Tekçe et al. reported high success rates and patient satisfaction after a 4-year follow-up of anterior direct composite restorations.<sup>9</sup> The esthetic success of such restorations is closely linked to the material's opacity, translucency, and color stability. In the present case, Tokuyama Estelite Asteria composite, with its high light transmittance and nano-hybrid structure, provided an optical effect closely resembling natural dental tissues. Additionally, Tokuyama Omnicroma Blocker was used to mask underlying structures in opaque areas, enhancing the restoration's depth and uniformity. The long-term success of composite restorations is influenced by factors such as occlusal forces, oral hygiene, operator technique, and the quality of finishing and polishing. Well-performed polishing not only preserves esthetic appearance but also reduces plaque accumulation.<sup>10</sup> In this case, the EVE spiral polishing system was used, contributing to a smooth surface and long-term color stability.

Post-treatment panoramic radiographs showed root resorption in the maxillary second primary molars. However, since no clinical mobility was observed, these teeth were retained as temporary space maintainers. Aktan et al. reported that under certain conditions, retained primary molars can serve as interim solutions

until implant placement.<sup>11</sup> Similarly, Robertsson and Mohlin emphasized that in growing patients, implant placement should be postponed and orthodontic space closure may provide long-term advantages.<sup>12</sup>

Removable clear retainers were used for post-treatment retention due to their esthetic acceptability in young patients. However, it is well established that fixed retainers may contribute to greater long-term stability, especially in cases involving anterior restorations.<sup>13</sup> Therefore, future follow-ups may consider the option of fixed retention.

In this case, no functional orthopedic treatment was applied due to the axial positions of the incisors. Consequently, the skeletal Class II relationship persisted following treatment. This limitation should be acknowledged in the interpretation of the treatment outcome.

## Conclusion

Congenital tooth agenesis, particularly when multiple teeth are involved, presents both functional and esthetic challenges that require comprehensive and well-coordinated treatment planning. This case highlights the importance of a multidisciplinary approach integrating orthodontic treatment, soft tissue management, and direct composite restorations to achieve satisfactory outcomes. The successful resolution of esthetic concerns, maintenance of occlusal balance, and the patient's satisfaction underscore the effectiveness of conservative and individualized strategies in the management of oligodontia cases.

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None

## Authors' Contributions

NT, NG, AMC and OO carried out the study design, data collection, and statistical analysis and drafted the manuscript. NG and AMC treated the patients and acquired the data. NT and OO conceived the study and participated in its design, coordination, and manuscript writing. The authors read and approved the final manuscript.

## Conflict of Interest Statement

The authors deny any conflicts of interest related to this study.

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