17th Year of Publication, No.2
December 2025

ORTHOPEDIC MAXILLARY EXPANSION IN AN ADOLESCENT PATIENT WITH TRANSVERSE MAXILLARY DEFICIENCY: A CASE REPORT

Pajtim Rexha*
*Doctor of Dental Medicine, Orthodontic Resident
Dental Clinic Dr. Safet Rexha
Vushtrri, Kosovo

Abstract

Transverse maxillary deficiency is a common skeletal condition observed during adolescence and is often associated with occlusal and functional disturbances. Orthopedic maxillary expansion represents an effective treatment modality during the growth period, allowing skeletal correction and functional improvement.

This case report presents the orthodontic treatment of an adolescent female patient diagnosed with transverse maxillary deficiency, deep bite, and a hyperdivergent growth pattern. Treatment included orthopedic maxillary expansion followed by fixed orthodontic therapy. Clinical results demonstrated stable maxillary expansion, improved occlusion, and satisfactory functional outcomes, confirming the effectiveness of this therapeutic approach during adolescence.

Keywords: *orthopedic maxillary expansion, adolescent, transverse maxillary deficiency, case report, orthodontics*

Introduction

Insufficient transverse development of the maxilla represents one of the most frequent skeletal discrepancies encountered in orthodontic practice. During adolescence, this condition may be associated with posterior crossbite, deep bite, altered occlusal relationships, and functional disturbances that negatively affect both function and facial harmony.

Orthopedic maxillary expansion (rapid palatal expansion – RPE) takes advantage of the biological responsiveness of the midpalatal suture during growth, enabling skeletal correction and reducing the need for more invasive treatment modalities in adulthood. The aim of this case report is to describe the clinical outcomes of orthopedic maxillary expansion combined with fixed orthodontic treatment in an adolescent patient with transverse maxillary deficiency.

Case Presentation

The patient presented for orthodontic consultation with chief complaints related to dental esthetics and functional discomfort. Medical history was non-contributory, with no contraindications for orthodontic treatment.

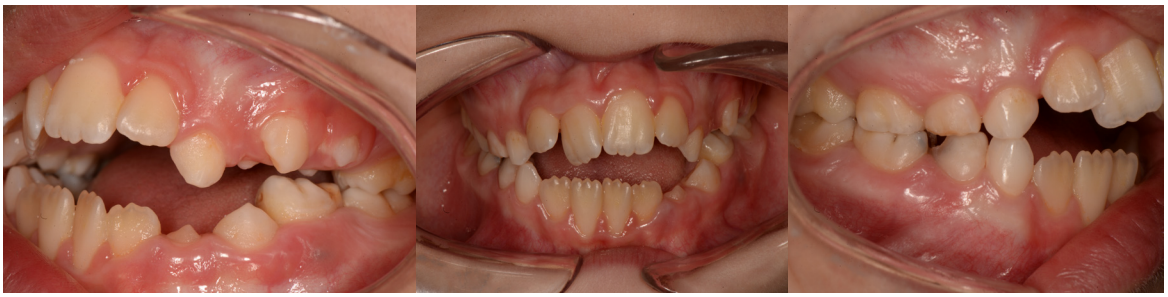
Initial Clinical Examination

Extraoral examination revealed a dolichofacial pattern with hyperdivergent characteristics. Intraoral ex-

amination showed:

- transverse maxillary deficiency
- bilateral Class II dental relationships
- open bite
- inadequate dental alignment

The clinical findings suggested a skeletal component contributing to the malocclusion.

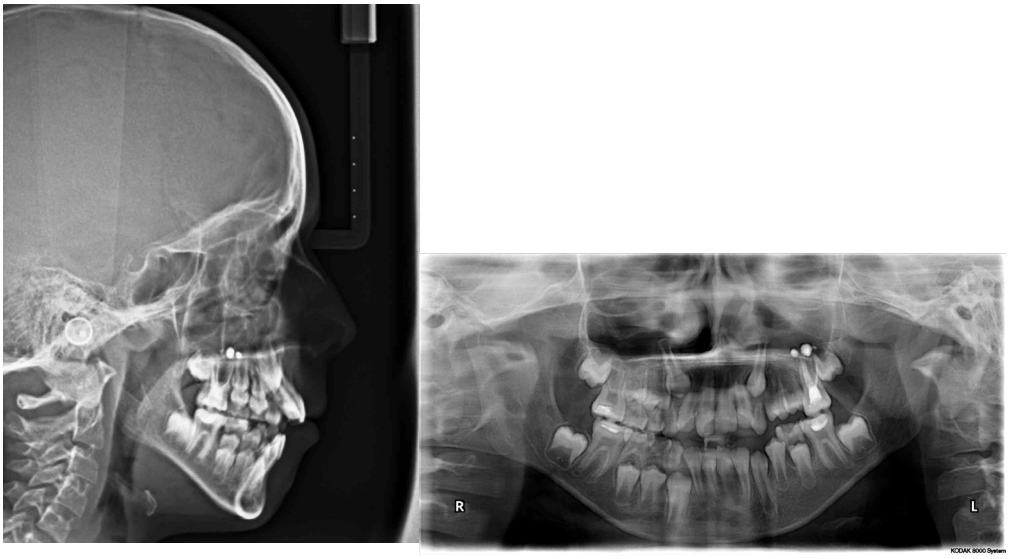


(Fig.1-3)

Radiographic Examination (Pre-treatment)

Initial radiographic evaluation included panoramic and lateral cephalometric radiographs. Cephalometric analysis confirmed a skeletal Class II pattern, a hyperdivergent growth tendency, and disharmony between the maxillary and mandibular structures.

Post-treatment radiographic examination was not performed in order to avoid unnecessary radiation exposure, in accordance with the ALARA principle, and due to the absence ofclInical indications.



Diagnosis

- Transverse maxillary deficiency
- Skeletal Class II malocclusion
- Open bite
- Hyperdivergent growth pattern
- Dolichofacial type

Treatment Objectives

The main objectives of treatment were:

- orthopedic expansion of the maxilla
- improvement of transverse and sagittal occlusal relationships
- vertical control
- functional stabilization

Treatment Plan

The treatment plan consisted of:

- orthopedic maxillary expansion using a rapid palatal expander (RPE) with palatal crib
- fixed orthodontic appliance with MBT prescription
- bilateral intrusion of posterior teeth
- controlled extrusion of anterior teeth
- collaboration with a speech therapist for tongue function re-education

Appliance Design and Treatment Protocol

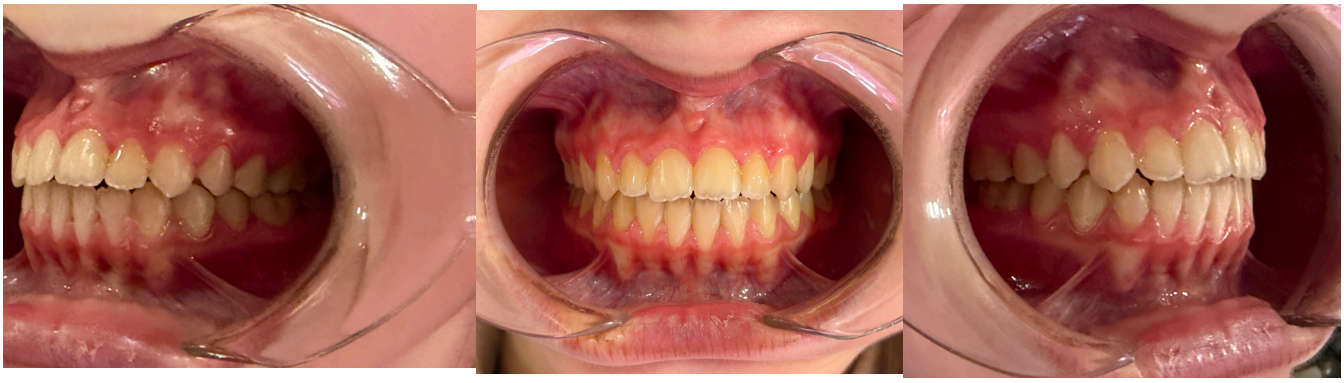
A rapid palatal expander (RPE) was used to achieve transverse maxillary expansion, followed by a lingual arch and fixed orthodontic appliance using the MBT system. Activation of the expander followed a standard protocol with an active expansion phase and a subsequent retention period to ensure stabilization of the achieved expansion.

Clinical Results

At the completion of treatment, clinical examination demonstrated:

- stable transverse expansion of the maxillary arch
- improved maxillomandibular transverse harmony
- reduction of open bite
- proper dental alignment and axial inclination
- satisfactory occlusal and functional stability

Periodontal tissues appeared healthy, with no signs of significant pathology.



(Fig. 4–7) Final results of orthodontic treatment

Discussion

Orthopedic maxillary expansion is a well-established and effective method for correcting transverse maxillary deficiency during the growth period. In adolescents, the midpalatal suture retains sufficient biological responsiveness, allowing true skeletal expansion with limited dentoalveolar compensation when compared to adult patients.

In the present case, the indication for orthopedic maxillary expansion was supported by the presence of transverse maxillary deficiency, a skeletal Class II pattern, and a hyperdivergent facial type. The clinical outcomes observed after treatment demonstrated stable transverse expansion of the maxillary arch and improved occlusal relationships, findings that are consistent with reports in the orthodontic literature.

An important aspect of this case was the combination of orthopedic expansion with fixed orthodontic therapy. This approach allowed precise control of dental movements and vertical dimension. In patients with hyperdivergent growth patterns and deep bite, vertical control represents a significant clinical challenge. The use of a fixed appliance with MBT prescription facilitated controlled posterior intrusion and anterior extrusion, contributing to the correction of the deep bite and improvement of overall occlusion.

Additionally, the incorporation of a functional approach through collaboration with a speech therapist played a relevant role in treatment stability. Abnormal tongue posture and function may negatively influence orthodontic outcomes and increase the risk of relapse. Functional re-education of the tongue, combined with skeletal and dental correction, may contribute to maintaining the achieved treatment results.

Although post-treatment radiographic evaluation was not performed in this case, detailed clinical assessment provided sufficient information to evaluate treatment success. Avoiding unnecessary radiographic exposure is particularly important in young patients, and thorough clinical documentation remains a valuable tool for outcome assessment while respecting radiation safety principles.

Overall, this case report illustrates that orthopedic maxillary expansion, when appropriately indicated and combined with fixed orthodontic therapy and functional management, can lead to favorable and stable clinical outcomes during adolescence.

Limitations

The absence of post-treatment radiographic evaluation represents a limitation of this case report. However, comprehensive clinical assessment was considered sufficient to evaluate treatment outcomes while respecting radiation safety principles.

Conclusions

Orthopedic maxillary expansion during adolescence is an effective and safe treatment modality for trans-

verse maxillary deficiency. When combined with fixed orthodontic treatment and functional management, it allows significant improvement in occlusion, function, and esthetics, with satisfactory clinical stability.

Informed Consent

Informed consent was obtained from the patient's legal guardian for orthodontic treatment and for the anonymous use of clinical data and intraoral photographs for scientific and educational purposes. Patient confidentiality was fully respected.

References

1. Rutili V, Mrakic G, Nieri M, Franceschi D, Pierleoni F, Giuntini V, Franchi L. Dento-skeletal effects produced by rapid versus slow maxillary expansion using fixed jackscrew expanders: a systematic review and meta-analysis. European Journal of Orthodontics. 2021;43(3):301–312. doi:10.1093/ejo/cjaa086. Available at: https://pubmed.ncbi.nlm.nih.gov/33950178/
2. Rutili V, Mrakic G, Nieri M, Franceschi D, Pierleoni F, Giuntini V, Franchi L. Comparison of rapid versus slow maxillary expansion on patient-reported outcome measures (PROMs) in growing patients: a systematic review and meta-analysis.Progress in Orthodontics. 2022. Available at: https://pubmed.ncbi.nlm.nih.gov/36503984/
3. Conflict of Interest The author declares no conflict of interest.