Romanian Dental Awards®

EDIȚIA A IV-A

INTERDISCIPLINARY ORAL REHABILITATION

2025

INTERDISCIPLINARY ORAL REHABILITATION

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1 Summary

The patient, aged 17 years, presented with severe aesthetic and occlusal dysfunction, manifested by generalized microdontia and pronounced wear of the dental structures, associated with a dentoalveolar malposition characteristic of amelogenesis imperfecta. The interdisciplinary evaluation integrated orthodontic diagnosis, periodontal analysis and three-dimensional functional occlusal evaluation. The therapeutic plan included correction of dentoalveolar relationships through sequential orthodontic treatment, surgical periodontal recontouring through laser-controlled coronal lengthening to rebalance the gingival zeniths, followed by all-ceramic prosthetic rehabilitation with prepless lithium disilicate restorations (Amber Press). The restorations were adhesively cemented with the dual Variolink Esthetic system, under millimetric occlusal control and final static-dynamic evaluation. The treatment led to the restoration of aesthetic-functional balance, with optimal dentofacial morpho-functional integration and three-dimensional occlusal stability clinically confirmed at the 1-month post-cementation check-up. The case highlights the fundamental role of interdisciplinary collaboration in restoring oral aesthetics and functionality in the context of structural enamel dysplasia.

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2 Consultation and Diagnosis

Clinical Data

- **Patient:** D. R.
- **Age:** 17
- **Sex:** male
- **Reason for consultation:** Unaesthetic aspect (unaesthetic anterior appearance,microdontia, abnormal crown shape andocclusal incongruity)
- **Medical history:** none reported systemic pathologies; negative dental history for trauma.

Clinical Examination

- The comprehensive evaluation included successive orthodontic consultations, prosthetics, periodontology and dental imaging..
- Radiological analysis (OPG and total CBCT) confirmed the integrity root canal and alveolar bone, allowing a conservative approach without the need for implant interventions.

General diagnosis: amelogenesis imperfecta associated with microdontia and dentoalveolar incongruity with dental crowding.

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General diagnosis: amelogenesis imperfecta associated with microdontia and dentoalveolar incongruity with dental crowding.

Orthodontics

- Diagnosis: amelogenesis imperfecta associated with generalized microdontia and dentoalveolar incongruity with moderate crowding.
- Objectives: three-dimensional realignment of the arches, restoring functional spaces for aesthetic prosthetic restorations and rebalancing the anterior guidance.
- Therapeutic stages: treatment with aligners, periodic check-ups and gradual occlusal adaptation.

Prosthetics

- Diagnosis:
  - asymmetry of the gingival zeniths and thin periodontal biotype.
  - unequal coronal proportions and unstable occlusion due to wear and microdontics
- Treatment plan: prosthetic rehabilitation through full prepless veneers made of lithium disilicate (Amber Press), performed by the laboratory.
- Intervention: laser-controlled coronal lengthening (with diode) on all present molars, to uniformize the gingival architecture and adequate coronal exposure for restorations.
- Cementation: Variolink Esthetic Dual – controlled adhesive technique, with static-dynamic verification.
- Purpose: functional periodontal recontouring and establishing a uniform biological base for subsequent restorations

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2 Consultation and Diagnosis

General diagnosis: amelogenesis imperfecta associated with microdontia and dentoalveolar incongruity with dental crowding.

Initial – August 2024

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Initial

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3 Treatment plan

No.	Stage	Specialist	Description / Purpose
1	Initial interdisciplinary consultation	Prosthodontist/ Orthodontist	Comprehensive clinical examination, photographic documentation, full CBCT, and interdisciplinary treatment planning. Diagnosis: Amelogenesis imperfecta, deep bite, Class II dental and skeletal relationship, microdontia, and dentoalveolar discrepancy with crowding.
2	Sequential orthodontic treatment	Orthodontist	Orthodontic alignment using sequential clear aligners to partially correct dental class, reduce overbite, and create optimal spaces for prosthetic reconstruction with crowns and veneers.
3	Crown lengthening with diode laser	Prosthodontist	Functional periodontal recontouring of molar areas; gingival zenith harmonization and exposure of clinical crowns.
4	Professional oral hygiene	Prosthodontist	Elimination of inflammatory factors and preparation of the prosthetic field.
5	Final intraoral scanning (3Shape)	Prosthodontist	Acquisition of digital models for wax-up design and prosthetic planning.
6	Digital wax-up and intraoral mock-up	Lab / Prosthodontist	Aesthetic and functional evaluation, verification of proportions and occlusal plane alignment.
7	Minimally invasive preparation and final impression	Prosthodontist	Selective enamel-only preparation guided by mock-up; maximum preservation of dental structure.
8	Fabrication of final all-ceramic restorations (Amber Press)	Lab	Prepless veneers made of lithium disilicate (Amber Press) – anatomical design with controlled translucency.
9	Adhesive cementation (Variolink Esthetic Dual)	Prosthodontist	Individually controlled adhesive cementation, verification of static and dynamic occlusion.
10	Postoperative control and functional evaluation	Interdisciplinary team	Aesthetic reevaluation, occlusal analysis, and periodontal stability assessment at 1-month follow-up.

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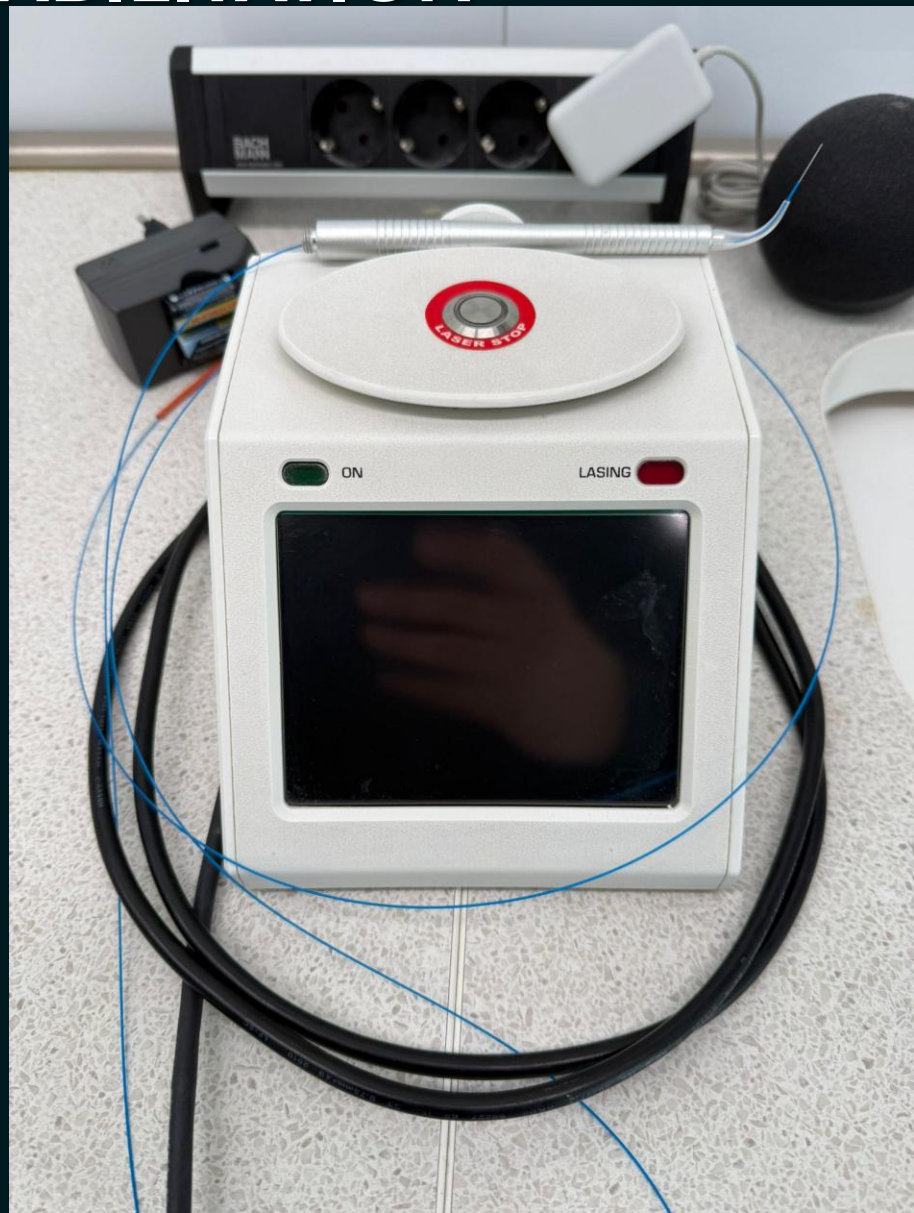
4 Surgical Crown Lengthening with Diode Laser

- The procedure aimed to restore the gingival architecture and the correct relationship between the anatomical and clinical crown. A controlled surgical crown-lengthening was performed using a diode laser technique, in order to achieve gingival symmetry and uniform exposure of the clinical crowns, without significant tissue trauma..

⚙ Technology and Parameters

- Device: Diode laser, 980 nm
- Average parameters: 1.0–1.5 W, continuous mode, 300 µm optical fiber
- Operating time: 2–4 minutes per quadrant
- Working mode: Gentle tangential contact, linear sweeping movements, continuous monitoring of thermal feedback
- The diode laser was selected for its high absorption in hemoglobin and pigmented tissues, ensuring immediate hemostasis, precise thermal control, and rapid healing. The use of a conventional scalpel was deliberately avoided to reduce the risk of gingival recession and preserve the thin gingival biotype within physiological limits.



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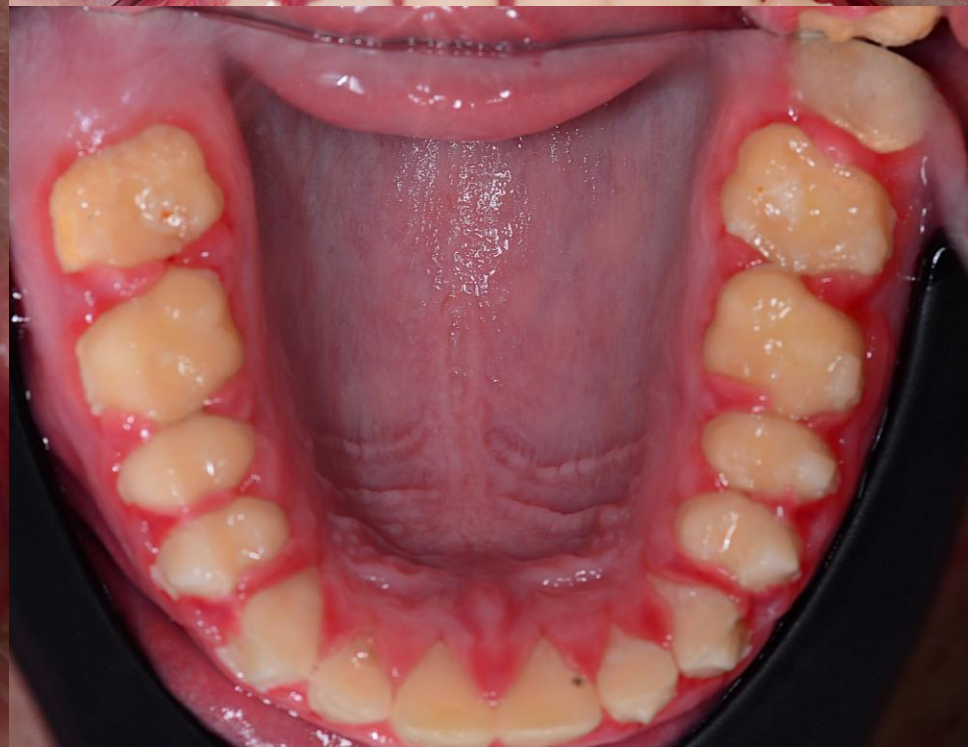
5 Orthodontic treatment

- Orthodontic therapy represented the first active stage within the interdisciplinary protocol, aiming to correct dentoalveolar incongruence and re-establish functional spaces required for the subsequent prosthetic rehabilitation. A system of sequential clear aligners was selected, customized according to the patient's arch morphology and degree of crowding, to achieve controlled three-dimensional dental movements with minimal biological stress.
- Objectiv: Achieving root parallelism and optimal interproximal spacing for the planned restorations.
- Guiding the final tooth positioning through periodic follow-up appointments every 3–4 months, ensuring stability and precision in occlusal alignment..


Before


After



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6

Wax-up + Mock-up

Wax-up digital

- The diagnostic model was created entirely in a digital workflow using the 3Shape Dental System, based on intraoral scan data and standardized facial reference photographs.
- The digital design stage enabled three-dimensional analysis of dental volumes, simulation of coronal proportions, and verification of the occlusal plane in relation to the interpupillary line and the aesthetic parameters of the lower facial third.
- The digital wax-up was used to delineate the exact limits of ceramic addition without any tissue reduction, supporting the planning of a fully conservative, prepless restorative protocol.
- Based on the virtual design, the Dental Dedication Laboratory fabricated a 3D-printed model, which was later used to create the transfer matrix for the intraoral mock-up.
- This stage allowed for aesthetic and functional validation of the final design and enhanced interdisciplinary communication between the clinician, dental technician, and patient.

Mock-up intraoral

- The mock-up was fabricated by directly transferring the digital wax-up into the oral cavity using a transparent silicone matrix and a light-cured provisional composite material.
- Application was performed under controlled visual and phonetic conditions to evaluate dental alignment, vertical dimension, phonetics, and overall morpho-functional integration within the facial context.
- The mock-up allowed precise verification of coronal proportions and labial contours, providing an accurate preview of the final aesthetic outcome without any invasive enamel reduction.
- Clinical assessment revealed harmonious facial esthetics and a stable centric occlusion, confirming the feasibility of a fully prepless restorative protocol with complete preservation of dental structure.
- The patient approved the proposed shape and dimensions, with only minimal incisal adjustments required.
- The validated mock-up served as a positional and morphological guide for the final fabrication and insertion of the ceramic restorations.

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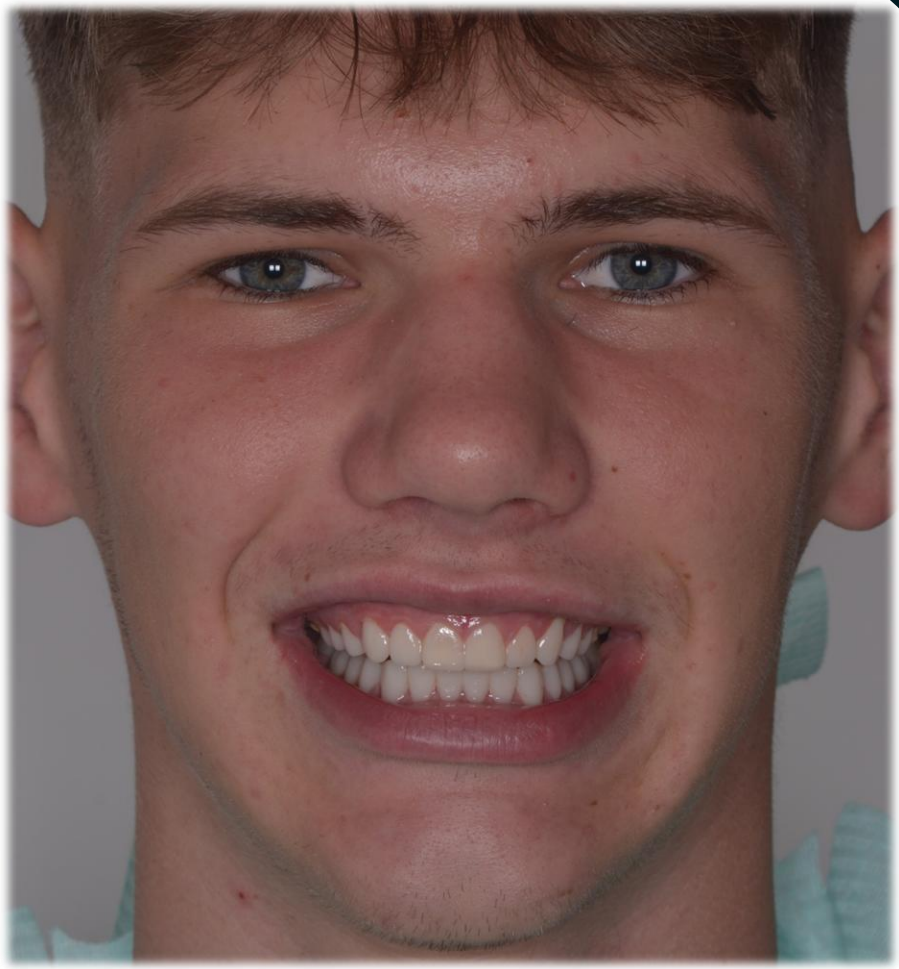
Wax-up + Mock-up

Wax-up digital



Mock-up intraoral

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Wax-up + Mock-up

Wax-up digital

Mock-up intraoral

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6 Wax-up + Mock-up – Final Intraoral Scanning

Following the aesthetic and functional validation of the intraoral mock-up, a final intraoral scan was performed using the 3Shape TRIOS system, under relative isolation with Optragate and a dry operative field. The primary objective of this stage was to obtain a high-fidelity digital record of the dental morphology and occlusal parameters in centric relation, ensuring a perfect correlation between the digital design and clinical reality. Both arches and the occlusal registration in maximum intercuspation were scanned, generating a complete STL dataset transmitted to the Laboratory for the CAD design and milling of the final lithium disilicate restorations (Amber Press). The digital workflow enabled simultaneous verification of occlusal contacts, interproximal relationships, and cement space distribution, eliminating inaccuracies inherent to conventional impression techniques. This phase ensured morpho-functional continuity between the validated mock-up and the definitive restorations, guaranteeing precise marginal adaptation and biomechanical compatibility within the interdisciplinary oral rehabilitation process.

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7 Prepless Final Restorations

- The final restorations were fabricated in collaboration with Laboratory, using the Amber Press system (HASS Corp., Korea) — a high-strength lithium disilicate material characterized by controlled translucency and optical properties closely resembling natural enamel. The definitive design was processed through CAD modeling based on the 3Shape digital scan, faithfully maintaining the contours validated during the intraoral mock-up stage. A fully prepless additive protocol was chosen, with marginal adaptation restricted to enamel surfaces, ensuring optimal bonding without any sacrifice of dental tissue.
- Each veneer was individually verified on the 3D-printed model and clinically tested for occlusal contacts, marginal proximity, and chromatic integration (shade B1). Following trial fitting, internal conditioning of the restorations was performed using 5% hydrofluoric acid etching (20 s), silanization with Monobond Plus, and enamel bonding with Variolink Esthetic Dual (Ivoclar Vivadent).
- Cementation was carried out under Optragate isolation using a controlled insertion technique, with polarized light inspection to confirm cement film uniformity. Excess material was removed using dental floss and a fine brush, followed by two-step light polymerization (tack-cure and complete polymerization for 40 s per segment).

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