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DIRECT AESTHETIC RESTORATIONS OF THE ANTERIOR TEETH

Priscu Nicolae, student, Faculty of stomatology, „Nicolae Testemițanu" SUMPh
Ciobanu Sergiu, PhD, ScD, univ. prof., Head of department, Department of odontology and periodontolgy „Sofia Sîrbu", „Nicolae Testemițanu" SUMPh

Background. Contemporary dentistry has progressed not only as a science but also as an art form, aiming to restore tooth morphology as closely as possible to its original state, providing maximal aesthetic results in combination with correct function and occlusion [11].

Direct aesthetic restorations of the anterior teeth are among the most frequent procedures in contemporary restorative dentistry, as patients place increasing importance on the aesthetic appearance of their smile, while the dentist seeks conservative solutions that preserve dental tissue [3, 8].

Systematic studies have demonstrated that direct composite restorations applied to the anterior teeth offer a good balance between tissue conservation, cost, and aesthetics. They are presented to the patient as a treatment method in cases of dental caries, fractures, diastemas, or incisal remodeling [3, 8].

The development of materials for anterior restorations has facilitated minimally invasive treatment, representing an attractive alternative compared to indirect prosthetic restorations [3, 8]. Alongside the demonstrated clinical success of direct composite restorations in standard Classes I-V, there has been an increasing expansion of indications over the last 20 years. Today, composite materials are also used for aesthetic-functional corrections regarding tooth position, shape, and shade [12]. Latest-generation dental adhesives match the color of both dentin and enamel, forming strong bonds with the tooth structure [2, 5].

However, clinical challenges persist: long-term durability, maintenance of color and gloss, wear, and marginal fracture remain frequent reasons for reintervention. Recent meta-analyses and reviews report average survival rates between 5–10 years for direct anterior restorations, with high variability depending on technique, material, and clinical conditions. These limitations motivate ongoing research into restorative techniques, finishing protocols, and direct comparisons with indirect solutions [1, 10].

The restoration of dental aesthetics has always constituted a fundamental pillar of odontological practice. Over the decades, the paradigm of restoring dentofacial harmony has significantly evolved: from an approach based on circumstantial solutions to one governed by therapeutic necessity, and from an elective nature to an imperative one. This transition has been driven by increasing social demands, in a context where aesthetic anomalies benefit from an ever-decreasing degree of collective tolerance [6].

Direct restoration techniques facilitate the morphological rehabilitation of dental units, optimizing dentofacial aesthetics through interventions such as the closure of diastemas and tremas, the correction of shape anomalies, or the restoration of structural integrity in cases of carious lesions, trauma, or functional

wear. Technological advances in the field of biomaterials also allow for the chromatic rehabilitation of a single tooth or an entire sextant, offering solutions for masking dyschromia. However, clinical success is often conditioned by the complexity of the cases, which requires a rigorous personalization of therapeutic protocols based on the clinical particularities of each patient [9].

In general, layering concepts have evolved from a primitive approach toward perfectly matching tooth color and its multiple dimensions. In fact, color integration as perceived by patients involves correct shade, opacity, opalescence, and fluorescence regarding optical determinants, as well as surface gloss and light reflection. An optimal result in terms of aesthetic integration is possible today, although it will rarely be achieved without the correct choice of material and appropriate layering [4].

Objective of the study. Increasing the efficiency of aesthetic odontological treatments for the anterior teeth.

Material and methods. The study included 34 participants, of whom 12 were men and 22 were women, aged between 18 and 60 years. The examined patients were scheduled for consultation and treatment during the 2025-2026 period. This is a clinical observational and descriptive experimental study, aiming to analyze the efficiency and aesthetic quality of various modern direct restoration techniques for anterior teeth. During the study, active intervention was performed by conducting direct anterior restorations using modern layering techniques as well as single-shade techniques; thus, it is not merely a theoretical observation, but a practical application under controlled clinical conditions.

Clinical data were analyzed based on medical records, radiological examinations (CBCT or OPG), and photometric examinations of the dental arches.

Patient selection was conducted based on the following inclusion criteria:

- Patients aged between 18 and 60 years;
- Presence of coronal defects in the anterior teeth (incisors and canines) caused by dental caries, trauma, abrasion, erosion, or dyschromia;
- Vital or endodontically treated teeth, without clinical or radiological signs of active periapical pathology;
- Good periodontal status or mild, controlled periodontitis;
- Stable occlusion, without traumatic interferences in the anterior zone;
- Adequate oral hygiene index and compliance with therapeutic recommendations;
- Informed consent of the patient for treatment and participation in the study.

Exclusion criteria:

- Patients with uncontrolled systemic diseases that may influence the healing or prognosis of the restorations;
- Presence of severe bruxism or other uncontrolled parafunctions;
- Carious lesions extending subgingivally or coronal fractures with root involvement;
- Advanced periodontal disease with increased tooth mobility;
- Extensive, inadequate previous anterior restorations requiring prosthetic treatment;
- Known allergies to materials used in dental restorations;
- Uncooperative patients or those with poor oral hygiene.

The following restorative materials were used: Estelite Asteria and Estelite Universal ”Flow”. Estelite Asteria is a universal light-cured restorative composite material developed by Tokuyama Dental, designed for direct restorations with high aesthetic demands, particularly in the anterior zone, but also in the posterior sector. The material is characterized by an optimized organic matrix and a high content of inorganic filler supra-nanoparticles. This particular structure provides the material with favorable mechanical properties, high resistance to wear and abrasion, as well as a superior capacity to maintain gloss over time (Figure 1).

Figure 1. Estelite Asteria Composite

Estelite Universal "Flow" is a universal light-cured flowable restorative composite developed by Tokuyama Dental, designed for minimally invasive direct restorations, as a liner or cavity base, as well as for direct restorations in the anterior and posterior regions. The material belongs to the category of supra-nano-filled flowable composites and is available in several grades of fluidity (High, Medium, Super Low) to allow for optimal adaptation to various clinical indications.

Compositionally, the material contains spherical supra-nanoparticles composed of silica-zirconia with dimensions of approximately 200 nm, obtained through sol-gel technology. The spherical morphology and uniform distribution of the particles allow for a higher filler content compared to conventional flowables, which results in improved mechanical properties without compromising fluidity and adaptation to the cavity walls (Figure 2).

Figure 2. Estelite Universal *"Flow"*

Results and Discussion. Thus, a direct restoration method through layering was utilized, combining flowable and packable composite materials. Dynamic monitoring of patients who underwent morpho-functional and aesthetic rehabilitation of the anterior teeth using the direct technique revealed satisfactory clinical results at all monitoring stages. During the periodic reassessment of the restorations, attention was focused on the dentoperiodontal status, occlusal analysis, dental shade evaluation, and the establishment of post-restorative indications. Simultaneously, photometric examinations and smile analyses were performed, and, where necessary, diagnostic wax-ups or mock-ups were utilized for the pre-visualization of the aesthetic result.

Shade selection is performed prior to the isolation of the operative field, under natural lighting or color-corrected light conditions. The dentin shade, enamel shade, and any potential special effects (translucency, opalescence) are evaluated separately, along with a photometric examination (Figure 3).

Figure 3. Photometric examination

The working field is then isolated using a rubber dam to ensure moisture control, optimal visibility, prevention of salivary contamination, and increased predictability of the adhesion (Figure 4).

Figure 4. Work field isolation.

The adhesive treatment includes acid etching using Blue ETCH etching gel, followed by rinsing and controlled drying, then the application of the adhesive system according to the manufacturer's protocol (Optibond FL Kit, Kerr), and light-curing.

The application of the Estelite Asteria composite begins with the modeling of the palatal wall to reduce polymerization shrinkage and to reproduce the natural tooth structure (Figure 5).

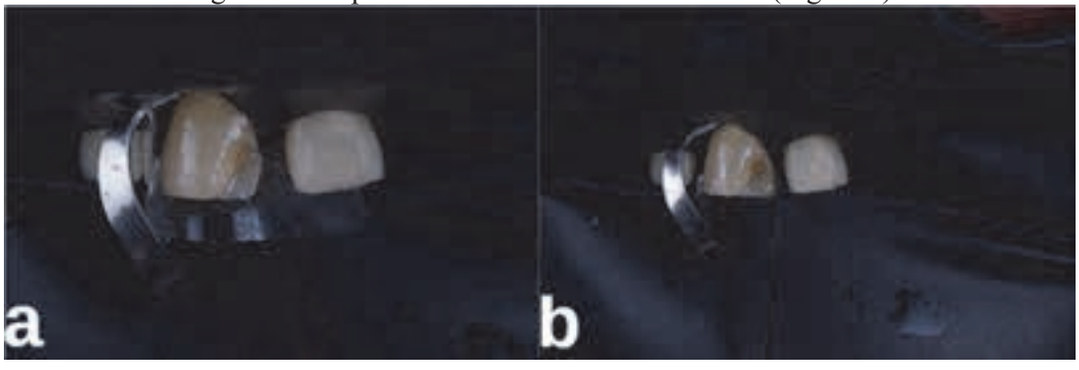

Figure 5. Modeling the palatal wall.

The trilaminar layering technique is an advanced level of the layering technique, where opaque dentin, body dentin, and enamel materials are used in combination to block light transmission. Since opaque materials

are utilized, a precise selection of the shade and thickness of the dentin and enamel layers is essential to achieve a successful aesthetic result. It is used to mask tooth discoloration in cases of dyschromia.

The clinical application of this concept involves a polychromatic layering of the restoration, using various degrees of opacity and saturation, from the cavity floor to the external surface. Since the optical properties of these masses do not always coincide with those of natural dental tissues, the faithful reproduction of anatomical structures requires an extensive learning curve.

The direct restoration technique using supra-nanocomposite materials through the layering technique allowed us to obtain durable aesthetic and functional results, which correlates with the findings reported in the specialized literature [5, 7].

Figure 6. Application of the polistratification technique

Finishing and polishing are performed sequentially using fine and extra-fine burs, abrasive discs, silicone polishers, and polishing pastes. This stage is essential for aesthetic stability, reduction of bacterial plaque retention, and patient comfort (Figure 7).

Figure 7. Final result of the restoration.

Conclusions. Direct anterior restorations performed with modern composite materials developed by Tokuyama Dental demonstrate high clinical and aesthetic performance, due to the combination of supra-nano filler technology and advanced polymerization systems. The use of universal and flowable composites with enhanced optical properties allows for the achievement of biomimetic restorations, with efficient chromatic integration and long-term aesthetic stability. From a mechanical perspective, the high filler content and the spherical particle structure result in adequate wear resistance, dimensional stability, and reduced polymerization shrinkage, which favor the maintenance of marginal adaptation and the long-term durability of the restoration. Furthermore, the high polishability and gloss retention contribute to the reduction of bacterial plaque retention and the maintenance of aesthetic properties, serving as important factors for the long-term clinical success of anterior restorations.

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