

Fabrication of Provisional Restorations Using the Injection Technique with Exaclear Material on the Lower Anterior Teeth - A Case Report

Nikolina Lešić¹, Davor Seifert² and Adnan Ćatović^{3*}

¹DMD, MSc, PhD, Associate Professor of Prosthetic Dentistry, School of Dental Medicine, University of Split, Croatia

²DMD, MSc, PhD, Professor of Gnathology, School of Dental Medicine, University of Split, Croatia

³DMD, MSc, PhD, Retired Professor of Fixed Prosthodontics and Geriatric Dentistry, School of Dental Medicine, University of Zagreb, Croatia

***Corresponding Author:** Adnan Ćatović, DMD, MSc, PhD, Retired Professor of Fixed Prosthodontics and Geriatric Dentistry, School of Dental Medicine, University of Zagreb, Croatia.

Received: June 10, 2025; **Published:** July 02, 2025

Abstract

Provisional or temporary restorations are indicated to protect prepared teeth, guide tissue healing, evaluate functional and esthetic outcomes, and increase patient satisfaction, during a period when a definitive prosthetic appliance is being fabricated. Proper fabrication and maintenance of temporary restoration facilitate a smooth transition to definitive restorations. Various techniques and materials are available in clinical practice for the fabrication of provisional restorations. In this case report is describe the use of the injection technique with composite and Exaclear material to fabricate a provisional restoration for six lower anterior teeth.

Keywords: Anterior Teeth; Provisional Restoration; Injection Technique; Exaclear Material

Introduction

Provisional (temporary) restorations are used in prosthetic dentistry to protect teeth and surrounding structures during the fabrication of permanent restorations [1,2]. Their primary purposes include:

- Pulp protection, to prevent sensitivity and shield exposed dentin and pulp from mechanical damage and bacterial invasion.
- Maintenance of tooth function, allowing normal chewing and speaking.
- Prevention of tooth movement, ensuring adjacent and opposing teeth remain in position.
- Aesthetic enhancement, especially for anterior regions, to provide a natural appearance during the interim phase.
- Treatment plan evaluation, allowing assessment of function, esthetics, and occlusion prior to final restoration.
- Facilitation of healing, especially following crown preparations or implant placement.

Provisional restorations also allows necessary modifications before final prosthetic appliance is completed. Numerous techniques and materials are currently employed for the fabrication of provisional restorations [3-7].

In this report, we utilized the injection technique with composite resin and exaclear silicone. Exaclear is a transparent silicone material that meets high esthetic demands and is successfully used in prosthodontics, orthodontics, and implant dentistry.

Citation: Adnan Ćatović, *et al.* "Fabrication of Provisional Restorations Using the Injection Technique with Exaclear Material on the Lower Anterior Teeth - A Case Report". *EC Dental Science* 24.7 (2025): 01-05.

Advancements in nanotechnology have led to the development of flowable composite resins that combine the mechanical strength, wear resistance, polish ability, and translucency of conventional composites with the adaptability and ease of use of flowable variants.

Additionally, these materials demonstrate reduced polymerization shrinkage-by nearly 20% [8,9]. Exaclear silicone enables the accurate transfer of tooth morphology from wax-ups or digital designs to the oral environment. Its transparency permits light polymerization of composite resin directly through the silicone template.

Case Report and Discussion

A 43-year-old male patient is presented with dissatisfaction regarding the esthetics of his teeth. The loss of mandibular first molars had resulted in excessive tooth wear, especially in the anterior segment (Figure 1), and a subsequent loss of vertical dimension.



Figure 1: Frontal view on lower abraded teeth of the patient.

After thorough evaluation, a comprehensive rehabilitation plan was proposed and accepted by the patient. The treatment plan included restoring vertical dimension with a combination of ceramic veneers, partial crowns, zirconia bridges, and screw-retained zirconia crowns on implants. Implants were placed in the edentulous posterior regions.

Before proceeding with definitive restorations, it was necessary to test whether the increased vertical dimension could be maintained without complications such as chipping or cracking. To do so, long-term provisional restorations were fabricated to monitor potential restoration failures during functional activities, including lateral and protrusive movements.

Composite resin was selected as the material of choice due to its: ease of repair, resistance to occlusal forces and suitability for testing both, function and esthetics.

Impressions of the upper and lower jaws were taken using a polyether material Exa'lence. Casts were poured in dental stone, and digital models were scanned using a laboratory scanner. A digital wax-up of the mandibular anterior teeth was created using ExoCad software (Figure 2). Occlusal relationships and jaw movements were evaluated in the virtual articulator during centric occlusion, protrusion, and lateral excursions. The digital wax-up model was subsequently 3D printed.



Figure 2: Digital wax-up of the mandibular anterior teeth.

An impression of the printed model was taken using Exaclear in a custom tray (Figure 3). Once the silicone material had set, it was removed to produce a transparent matrix for injecting light-curing flowable composite. Injection channels were created on the incisal edge of each tooth using root canal drills. The silicone matrix was tried in the patient's mouth.



Figure 3: Impression of the printed model with Exaclear material.

Following local anesthesia, retraction cords were placed and teeth prepared for lithium disilicate ceramic veneers (Figure 4). Teeth were dried slightly to remove excess moisture. No etching or bonding agent was applied.



Figure 4: Frontal view of prepared teeth.

Flowable composite was injected through the prepared channels, one tooth at a time. Excess material was vented through unused channels (Figure 5). Once filled, the composite was light-cured for 20 seconds per tooth using a LED curing unit. The silicone matrix was removed, and excess material trimmed.



Figure 5: Injection of liquid composite through the prepared channels.

Restorations were finished extraorally using composite burs and polishers, with final intraoral adjustments. Polishing was completed using abrasive instruments and polishing discs. The restoration surfaces were coated with Stick Resin to seal the composite surface, enhance gloss, and reduce plaque adhesion.

The provisional restoration was not cemented, relying on primary retention. It was inserted in the mouth for three months without any fractures or damage (Figure 6). After the trial period, definitive occlusal relationship was established and final restorations (lithium disilicate veneers) were fabricated and cemented using adhesive protocols.



Figure 6: Finale view of provisional restorations.

Conclusion

The fabrication of long-term provisional restorations using a transparent silicone matrix is a fast and reliable technique for achieving functional and esthetic results. Composite resin offers superior performance over acrylic materials for long-term use. The use of a transparent silicone matrix allows efficient transfer of tooth morphology and light-curing of composite resin, making the method particularly effective for multiple restorations, saving the time while maintaining acceptable esthetics and durability.

Bibliography

1. Gia YN., *et al.* "The injectable resin composite restorative technique: A case report". *Journal of Esthetic and Restorative Dentistry* 33.3 (2021): 404-414.
2. KeunBaDa Son., *et al.* "Marginal and internal fit and intaglio surface trueness of temporary crowns fabricated with stereolithography, digital light processing, and milling technology". *International Journal of Prosthodontics* 35.5 (2022): 697-701.
3. Artak G., *et al.* "Provisional restorations in restorative dentistry". *World Science* 3.6.46 (2019): 11-16.
4. Shaalan OO., *et al.* "Clinical evaluation of flowable resin composite versus conventional resin composite in carious and noncarious lesions: Systematic review and meta-analysis". *Journal of Conservative Dentistry* 20.6 (2017): 380-385.
5. Tahayeri A., *et al.* "3D printed versus conventionally cured provisional crown and bridge dental materials". *Dental Materials* 34.2 (2018): 192-200.
6. Zafar M. "Prosthodontic applications of polymethyl methacrylate (PMMA): An update". *Polymers (Basel)* 12.10 (2020): 2299.
7. Hellyer P. "3D printed temporary restorations are stronger". *British Dental Journal* 233.3 (2022): 218.
8. Sari T., *et al.* "Temporary materials: comparison of *in vivo* and *in vitro* performance". *Clinical Oral Investigations* 24.11 (2020): 4061-4068.
9. Mizrahi B. "Temporary restorations: the key to success". *British Dental Journal* 226.10 (2019): 761-768.

Volume 24 Issue 7 July 2025

©All rights reserved by Adnan Ćatović., *et al.*