Case Report

**Esthetic and functional restorative management with composite resin veneers in a patient with bruxism: clinical guideline proposal**

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**ABSTRACT**

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| A 38-year-old male patient presented with recurrent fractures of composite restorations on his maxillary anterior teeth, associated with nocturnal bruxism. He sought care at the clinical training facility of the Professional Master’s Program in Dentistry at the University of Fortaleza. Clinical examination, patient interview, and photographic documentation confirmed esthetic compromise and functional instability due to failed restorations. These were removed and replaced with direct composite resin veneers, following strict adhesive, insertion, polymerization, and polishing protocols. To control the underlying parafunctional habit, a 2 mm-thick acrylic stabilizing occlusal splint was fabricated and delivered, along with precise occlusal adjustments on the teeth, restorations, and splint. Notably, in this case, nocturnal bruxism was the primary etiological factor contributing to the repeated restorative failure, highlighting the importance of a multidisciplinary approach. A comprehensive, evidence-based clinical guideline was followed and is proposed to assist in the esthetic and functional rehabilitation of similar cases. Developed in collaboration with experienced professionals, the protocol supports conservative management, improves long-term outcomes, and promotes evidence-based decision-making at all stages of care. |

**1. INTRODUCTION**

Bruxism is a pathological condition characterized by clenching or grinding of teeth due to mandibular muscle hyperactivity. It is classified as awake or sleep bruxism, both leading to significant tooth wear, sensitivity, headaches, and otalgia if unmanaged. Its presence must be considered when planning restorative procedures (1-2).

The advancement of light-cured composite resins, particularly through reduced filler particle size, has improved their physical and optical properties. Consequently, composites are ideal for complex restorative procedures, offering strength, versatility, minimal invasiveness, and natural esthetics, thereby enhancing patient satisfaction (3).

Although adhesive techniques are technique-sensitive, requiring effective isolation and strict protocol adherence, the direct veneer technique is a viable alternative to indirect ceramics. While ceramics provide esthetic and functional benefits, they entail higher costs, longer procedures, and more invasive tooth preparation. Conversely, composite veneers offer lower costs, predictability, and easier repairability (4-5).

Composite restorations are especially suitable for patients with bruxism, a parafunctional habit causing significant dental damage. A multidisciplinary approach is essential for successful outcomes (2). Thus, combining composite resin with management of masticatory parafunction is a promising strategy.

Bruxist patients often present with tooth wear, compromising function, esthetics, and oral health. Management is often challenging due to the inherent complexities of each case. Therefore, this report presents both a clinical case and a proposed guideline for esthetic and functional rehabilitation using composite veneers in patients with nocturnal bruxism.

**2. PRESENTATION OF CASE**

***Anamnesis***

A 40-year-old male non-smoker, non-drinker, with no comorbidities or systemic conditions, and not engaged in physical activities sought care at the dental service with the following complaint: “I sought care because the previous restorations either fell out or fractured.” The patient reported grinding his teeth at night, which characterized a case of nocturnal bruxism, and stated that he did not use a stabilization splint. After conducting a thorough investigation and collecting the health history, the patient signed the Informed Consent Form authorizing the treatment and case documentation.

***Clinical Examination***

During the evaluation, fractures were observed on the incisal edges of teeth Upper Right Lateral Incisor (12) and Upper Left Lateral Incisor (22), along with wear and displacement on the buccal surfaces of teeth Upper Right Central Incisor (11) and Upper Left Central Incisor (21), and absence of canine guidance on teeth Upper Right Canine (13) and Upper Left Canine (23). These findings support the patient’s report of nocturnal teeth grinding. The gingival appearance was healthy, with no pathological signs (**Figures 1 and 2**).

**Figure 1.** Initial condition.



**Figure 2.** Initial condition upper arch.



***Clinical Procedures***

Initially, the patient was informed about the importance of a multidisciplinary approach in managing bruxism. Subsequently, the dental surfaces were cleaned using a Robson brush, pumice stone, and Herjos prophylactic paste (Coltene, Altstätten, Switzerland).

The treatment plan included the removal of the anterior veneers from teeth 12, 11, 21, and 22, and the fabrication of new veneers from teeth 13 to 23, followed by the fabrication and installation of an occlusal stabilization splint. The following restorative materials were selected: for tooth 11, A2D and A2E Empress Direct composite resins (Ivoclar Vivadent, Zurich, Switzerland) and translucent resin Trans 30 (Ivoclar Vivadent, Zurich, Switzerland); for tooth 21, A1D Filtek Z350 XT (3M ESPE, St. Paul, United States), A2D and A2E (Ivoclar Vivadent, Zurich, Switzerland), and translucent resin (Ivoclar Vivadent, Zurich, Switzerland); for teeth 12 and 22, A2D and A2E (Ivoclar Vivadent, Zurich, Switzerland) and translucent resin (Ivoclar Vivadent, Zurich, Switzerland). For teeth 13 and 23, only translucent resin (Ivoclar Vivadent, Zurich, Switzerland) was used.

After shade selection, relative isolation was performed, and the previous veneers were removed with fine and extra-fine diamond burs KG Sorensen (Cotia, São Paulo, Brasil). The preparations were then refined and finished using a set of fine and extra-fine diamond burs and coarse-grit Sof-Lex Pop-On discs (3M ESPE, St. Paul, United States).

Acid etching was performed with 37% phosphoric acid (FGM, Joinville, Brazil), applied for 30 seconds on enamel and 15 seconds on dentin, followed by rinsing for 60 seconds. The area was dried with indirect air spray for 10 seconds, keeping the dentin cavity dry and without shine. Then, Single Bond Universal adhesive (3M ESPE, St. Paul, United States) was applied and light-cured with Valo Cordless Grand 3200 light-curing unit (Ultradent, South Jordan, United States) for 20 seconds. For the restorative procedure, after careful evaluation and proportion measurements of height and width, modified absolute isolation was applied along with a gingival retraction cord to control sulcular moisture. The incremental freehand technique with polyester strips was used, following esthetic principles and the golden proportion for composite resin veneers (**Figures 3 and 4**).

**Figure 3.** Modified isolation performed for incremental insertion of composite resin.



**Figure 4.** Incremental insertion of composite resin for veneer fabrication on tooth 12.



Finishing and polishing of the veneers were performed using fine and extra-fine diamond burs (Microdont), Diamond Excel polishing paste (FGM, Joinville, Brazil), felt discs, an abrasive rubber kit (Microdent, São Paulo, Brazil) at low speed, Sof-Lex Pop-On discs (3M ESPE, St. Paul, United States), metal abrasive strips for removing interproximal excesses, and no. 12 scalpel blades for removing cervical excesses under controlled moisture (**Figure 5**).

**Figure 5.** Finishing performed with fine and extra-fine diamond burs.



After completing the restorations (**Figures 6 and 7**), upper and lower impressions were taken, as well as a bite registration, and the materials were sent to the laboratory for fabrication of a rigid stabilization splint with 2 mm thickness, smooth surface, and made of acrylic resin.

**Figure 6.** Immediate final result.



**Figure 7.** Final result view of the upper and lower arches.



Subsequently, the smooth occlusal device was installed and adjusted according to the patient’s occlusal needs (**Figures 8 and 9**). Two follow-up visits were conducted for occlusal splint adjustment, using a straight handpiece and tungsten carbide bur (KG Sorensen, Barueri, Brazil), guided by articulating paper to ensure at least three balanced bilateral contacts. The device was then polished with the PM Ultra-technique kit (American Burrs, Santa Catarina, Brazil).

**Figure 8.** Final aspect of the upper arch.



**Figure 9.** Fabricated splint.



The case was concluded with clinical reevaluation, control, and monthly follow-up to ensure treatment success (**Figures 10 and 11**). The patient was reassessed after three months, and the veneers remained intact, contrasting with the previous treatment, where the restorations fractured within less than 24 hours after the procedure.

**Figure 10.** Final result.



**Figure 11.** Occlusal stabilization device in the oral cavity.

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**3. DISCUSSION**

Bruxism is a common condition that poses significant challenges to modern restorative dentistry. While the literature diverges on the ideal restorative material for bruxist patients, there is consensus on the need for durability and strength. The evolution of composite formulations, incorporating reinforcing particles, has enhanced both mechanical resistance and esthetics (3).

However, strength depends not only on the material but also on adhesion and photopolymerization, which are critical to prevent micropermeability and nanoleakage, particularly in bruxist patients (6). Wysokińska-Miszczuk et al. (7) demonstrated the importance of proper finishing and polishing, emphasizing that both technical skill and polishing paste quality are relevant. The paste’s efficiency may also be influenced by force and temperature.

The rehabilitation described by Floriani et al. (8), using semi-direct composite veneers, supports a conservative, esthetic, and functional alternative. The report underscores the need for individualized planning and occlusal assessment to ensure proper balance. Granell-Ruíz et al. (9) evaluated the impact of bruxism on porcelain laminate veneers, a material known for its esthetic and functional performance. Bruxism was a key factor in treatment failure, though stabilizing devices significantly reduced fracture risk.

In this case, direct freehand resin composites were used, consistent with the literature. Incremental insertion reduced stress, followed by appropriate photopolymerization and occlusal adjustment to prevent imbalance. Despite the susceptibility to failure even in porcelain restorations, composites offer lower cost, easier repair, and simpler maintenance (3; 8; 9-10).

Bruxism is driven by various triggers, often linked to the patient’s routine. The use of a stabilization splint to control bruxism-induced movement and protect the veneers aligns with Faus-Matoses et al. (10), who found that regular use of the device over eight years reduced complications in bruxist patients. Thus, occlusal devices alone are insufficient; multidisciplinary management is essential (1). Accordingly, the patient was advised to seek psychological support and adopt regular physical activity.

The literature remains limited regarding optimal restorative strategies for bruxist patients, especially in balancing esthetics, durability, and cost. This case shows promising short-term outcomes with composite veneers and occlusal splints, but generalizability is limited. Future clinical studies comparing materials in bruxist patients, with long-term follow-up and patient-centered outcomes, are essential. In vivo research should be prioritized, as in vitro models fail to replicate the biomechanical and biological complexities of oral parafunctions.

Rehabilitation of bruxist patients requires specialized care and challenges even experienced clinicians. Based on this case, the reviewed literature, and clinical experience, a guideline for the esthetic management of bruxist patients is proposed to support clinical decision-making and optimize outcomes (Table 1).

**Table 1.** Suggested guideline for esthetic and functional management of bruxist patients

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| **Education** | Educate the patient about the condition, the need for control, regular follow-up, potential repairs, and oral hygiene care. |
| Request complementary examinations when necessary to better understand the condition. |
| Emphasize the importance of a multidisciplinary team for successful treatment. |
| **Assessment** | Conduct a comprehensive anamnesis, focusing on parafunctional habits, medical history, lifestyle, stress levels, and musculoskeletal symptoms. |
| Evaluate occlusal wear patterns, self-reported clenching or grinding, tooth mobility, sensitivity, and masticatory muscle fatigue. |
| Perform imaging of the temporomandibular joint, such as Computed Tomography and Magnetic Resonance Imaging, when indicated. |
| Obtain informed consent and photographic documentation for monitoring. |
| **Planning** | Select appropriate restorative materials and techniques, considering composite or ceramic systems and high-strength cements compatible with occlusal overload. |
| Define adhesive protocol and etching procedure according to the substrate and adhesive system. |
| Ensure controlled and efficient light-curing to achieve proper polymerization and minimize internal stresses. |
| Select restorative options that are durable, cost-effective, and feasible, taking into account the patient’s financial situation and overall social background. |
| Plan for the fabrication of a stabilization splint in cases where necessary. |
| **Treatment** | Prefer minimally invasive adhesive techniques to preserve remaining tooth structure. |
| Perform selective and planned tooth reduction, ensuring precise occlusal adjustment for optimal force distribution. |
| Refer the patient to other specialists, such as psychologists, orofacial physiotherapists, psychiatrists, or oral surgeons when necessary. |
| **Maintenance** | Schedule short-term recall intervals (3–6 months) to monitor wear and restoration integrity. |
| Periodically reassess the effectiveness of the occlusal splint and make adjustments as needed. |
| Recommend multidisciplinary support for stress management and sleep disorder control. |

**4. Conclusion**

Bruxism poses a significant challenge to restorative dental procedures, requiring materials that combine strength, durability, and esthetics. The use of resin composites, along with individualized planning, proper finishing, polishing, and occlusal adjustment, offers a viable and conservative alternative, especially when combined with stabilization splints. Treatment success also depends on patient adherence to behavioral changes and psychological support.

**Consent**

All authors declare that written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

**Ethical approval**

All authors hereby declare that all have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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