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REABILITAÇÃO ESTÉTICA E FUNCIONAL DE DENTES ANTERIORES FRATURADOS COM O USO DA MATRIZ BRB: CASO CLÍNICO

AESTHETIC AND FUNCTIONAL REHABILITATION OF FRACTURED ANTERIOR TEETH WITH THE BRB MATRIX TECHNIQUE: A CASE REPORT

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RESUMO:
O sorriso exerce papel central na comunicação humana, refletindo saúde, bem-estar e autoestima, sendo os dentes anteriores fundamentais para a estética e a função mastigatória e fonoarticulatória. Fraturas nesses dentes acarretam impacto funcional e psicológico, comprometendo a qualidade de vida. O objetivo deste trabalho é relatar um caso clínico de reabilitação estética e funcional de dentes anteriores fracturados por meio da técnica de matriz BRB associada à restauração direta em resina composta. Foram utilizados dentes anteriores comprometidos por fratura, matriz BRB e sistema adesivo convencional, com contorno e polimento meticulosos. Os resultados demonstraram boa adaptação anatômica, estética harmoniosa e função restaurada, com estabilidade clínica em curto-prazo. A técnica mostrou-se previsível, eficiente e com reduzido número de sessões, favorecendo a reabilitação estética e funcional imediata. Conclui-se que a matriz BRB é uma opção viável para o tratamento de fraturas de dentes anteriores, com bons resultados estéticos e funcionais em restaurações diretas.
Palavras-chave: Fratura dentária; Restauração direta; Resina composta; Matriz BRB.

ABSTRACT:
The smile holds a central role in human communication, reflecting health, well-being, and self-esteem, with anterior teeth being fundamental for aesthetics and masticatory and phonetic function. Fractures of these teeth cause functional and psychological impact, compromising quality of life. The objective of this study is to report a clinical case of aesthetic and functional rehabilitation of fractured anterior teeth using the BRB matrix technique associated with direct composite resin restoration. Anterior teeth affected by fractures, a BRB matrix, and a conventional adhesive system were used, with meticulous contouring and polishing. The results showed good anatomical adaptation, harmonious aesthetics, and restored function, with clinical stability in the short term. The technique proved to be predictable, efficient, and required a reduced number of clinical sessions, favoring immediate aesthetic and functional rehabilitation. It is concluded that the BRB matrix is a viable option for the treatment of fractures in anterior teeth, providing satisfactory aesthetic and functional outcomes in direct restorations.
Keywords: Dental fracture; Direct restoration; Composite resin; BRB matrix.

INTRODUCTION

The smile has a central role in human communication, reflecting health, well-being, and self-esteem, with the anterior teeth performing a decisive function in esthetics as well as

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in masticatory and speech function (Alves, 2014; Santos et al., 2016; Anderson & Lopes, 2023; Coutinho, 2016; Rodrigues et al., 2023). Harmony among teeth, gingiva, and lips is essential for a natural smile; any alteration caused by trauma, wear, or other factors can compromise appearance, mastication, occlusion, and speech, negatively affecting quality of life (Guerra, 2018; Pereira, Pereira & Brígido, 2023).

Fractures of the anterior teeth, generally resulting from direct trauma to the oral cavity, parafunctional habits, or enamel wear and erosion, constitute frequent dental emergencies, particularly affecting the maxillary central incisors (Queiroz et al., 2019; Rodrigues et al., 2023; Freitas et al., 2009). The esthetic and functional restoration of these teeth is a clinically significant challenge that requires advanced restorative techniques (Freitas et al., 2009; Rodrigues et al., 2023).

Given the different treatment options—orthodontic therapy, indirect restorations (crowns and ceramic veneers), and direct composite resin restorations—the dentist must consider the tooth's clinical condition, esthetic expectations, cost, and longevity (Da Silva et al., 2021; Nieri et al., 2022). Advances in adhesive technologies and the properties of dental materials have enabled minimally invasive treatments that combine durability, accessibility, and excellent esthetic outcomes (Rodrigues et al., 2023; Gondo, Marson & Alvares, 2025). In this context, composite resins stand out for their versatility, good adaptation, physical-mechanical properties similar to those of tooth structure, minimally invasive technique, predictability, reparability, optimization of clinical time, and favorable cost-benefit ratio (Espíndola-Castro et al., 2019; Rodrigues et al., 2023; Nieri et al., 2022; Demirci et al., 2015).

Among direct restorative techniques, the BRB matrix technique (Bertholdo/Ricci/Barrotte) is noteworthy; it uses a prefabricated silicone matrix to shape the composite resin with greater precision, facilitating the reanatomization of fractured anterior teeth in a single session without laboratory steps, thereby reducing cost and chair time (Bertholdo, Albino & Ricci, 2014; Pombo, 2019; Araújo Júnior & Ilkiu, 2018; Rêis & Santos, 2018). Personalization of the matrix promotes better adaptation of the resin, greater predictability, lower risk of adaptation failures, and reduced working time, yielding satisfactory esthetic and functional results in both simple and complex fracture cases (Nieri et al., 2022; Correia et al., 2024; Santos et al., 2024; Freitas et al., 2021). Recent studies indicate that the BRB technique also contributes to the strength and longevity of restorations in anterior teeth subjected to high functional demands (Santos et al., 2024; Freitas et al., 2021; Anderson & Lopes, 2023).

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Thus, the BRB matrix technique is established as an effective option for the esthetic and functional rehabilitation of fractured anterior teeth, restoring dental anatomy, occlusal balance, speech, esthetics, and self-esteem, with a positive impact on quality of life and social interaction (Pereira, Pereira & Brígido, 2023; Guerra, 2018; Anderson & Lopes, 2023; Freitas et al., 2021). In this context, the present study aims to report a clinical case of a middle/incisal third fracture of the maxillary central incisors restored by direct composite resin using the BRB matrix technique.

METHODOLOGY

This work is a descriptive clinical case report carried out at the Teaching Clinic of the Faculty of Dentistry of the Centro Universitário das Faculdades Integradas de Ourinhos (UNIFIO). The protocol adhered to the guidelines of Resolution 466/2012 of the National Health Council, ensuring privacy and confidentiality and obtaining a signed Informed Consent Form authorizing the use of clinical data and images for academic reporting, as well as approval from the Research Ethics Committee (CAAE 87087625.6.0000.0332).

CASE REPORT

A 47-year-old male patient presented to the Dental Clinic of the Centro Universitário das Faculdades Integradas de Ourinhos (UNIFIO) complaining of esthetic and functional discomfort of the maxillary anterior teeth, clinically evident on initial examination (Image 1). He reported childhood trauma and recurrent failures of previous restorative treatments on the anterior teeth, which aggravated his dissatisfaction with his appearance.

After consent, medical history and extra- and intraoral clinical examinations were performed, revealing no relevant systemic diseases nor significant alterations of the facial or neck tissues. Intraoral examination showed generalized plaque, absence of teeth 14, 15, 16, 25, 26, 36, 37, and 46, in addition to loss of tooth structure of the maxillary central incisors (11 and 21) without pulpal involvement, pain, or mobility (Image 1).

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Image 1 – Initial intraoral appearance of the patient



Source: Author (2025).

Based on the findings, a treatment plan was devised that included periodontal therapy (full‑mouth prophylaxis and scaling), polishing of satisfactory restorations, direct restoration of the maxillary central incisors using a BRB matrix, and fabrication of removable prostheses for the maxilla and mandible.

At the first appointment, prophylaxis and full‑mouth scaling were performed. A periapical radiograph of teeth 11 and 21 was then obtained, showing intact remnants and supporting tissues without periapical lesions. To begin the restorative phase, a BRB matrix was fabricated using condensation silicone. The heavy‑body silicone was mixed according to the manufacturer's instructions and placed over the fracture area (Image 2), subsequently outlined, trimmed, and adjusted with a straight handpiece, a multi‑blade bur, and a No. 12 surgical blade (Image 3). The finalized matrix was then tried in and adjusted to confirm anatomical fit (Image 4).

Image 2 – Impression of the fractured tooth elements



Source: Author (2025).

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Image 3 – Trimming and adjustment of the BRB matrix



Source: Author (2025).

Image 4 – Final appearance of the BRB matrix



Source: Author (2025).

During the same session, shade selection for the teeth to be restored was performed using the VITA shade guide, selecting A2 for enamel and A3 for dentin. Absolute isolation was then established from canine (13) to premolar (24), including floss ligature between the incisors and placement of a No. 208 clamp. The remaining restorative material was removed with high-speed rotary instruments, and a bevel approximately 2 mm wide was prepared. After selective etching of the enamel with 37% phosphoric acid, rinsing and drying, a universal adhesive was applied; the solvent was evaporated with a gentle air stream and light-cured for 20 seconds on the palatal and buccal surfaces.

With the BRB matrix adjusted, a thin layer of enamel composite EA2 was placed on the guide to form the palatal surface of the teeth to be reconstructed (Image 5). The matrix was positioned intraorally and the composite resin was light-cured for 40 seconds (Image 6).

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Subsequent increments of dentin composite DA3 were placed within the palatal shell and over the remaining dentin structure, and finally a thin layer of enamel composite EA2 was applied over the entire restoration to achieve anatomic transition and colorimetric harmony with the remaining tooth structure.

Image 5 – Restorative material placed in the BRB matrix



Source: Author (2025).

Image 6 – BRB matrix positioned on the fractured tooth elements



Source: Author (2025).

Occlusal contacts were adjusted to ensure the absence of premature contacts. Finishing was performed with abrasive discs and diamond-coated polishing points to shape the form, surface texture, and secondary anatomy, followed by final polishing in a subsequent session using sanding discs, felt polishing pads, and diamond polishing paste, yielding a smooth

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surface and appropriate esthetic luster (Image 7). The patient reported being highly satisfied with the esthetic and functional outcome after completion of the final session.

Image 7 – Final intraoral appearance of the direct composite resin restoration.



Source: Author (2025).

RESULTS AND DISCUSSION

The literature describes several restorative techniques for fractured teeth (Da Silva, 2015; Araújo Júnior & Ilkiu, 2018). In the present case report, rehabilitation was achieved by direct composite resin restoration using the BRB matrix technique.

Dental esthetics plays a fundamental role both physiologically and socially. Physiologically, anterior teeth are essential for mastication and speech, directly contributing to adequate oral function. Socially, esthetic factors markedly influence an individual's self-esteem and are among the most noticed aspects in social interaction, particularly the smile, which stands out early in a global assessment of the person (Rezende & Fajardo, 2016; Anderson & Lopes, 2023). Integrity of the anterior teeth supports facial balance and smile harmony, affecting personal image perception and self-confidence. Thus, tooth fracture is a condition that requires dental intervention not only for functional recovery but also for esthetic rehabilitation (Rodrigues et al., 2023).

Reanatomization with direct composite resin associated with a silicone matrix makes the procedure more practical, helps in establishing proximal contacts, increases predictability of results, and reduces the need for extensive occlusal adjustments. However, due to the requirement for preliminary molds and finishing steps, this technique has certain limitations, such as higher cost and the potential need for multiple clinical sessions. To optimize this process, the BRB matrix was developed with the aim of simplifying the procedure, reducing

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treatment time and costs, and enabling completion of many cases in a single session (Bertholdo, Albino & Ricci, 2014; Rodrigues et al., 2023).

Accordingly, for the presented case, a treatment plan was implemented that objectively restored function and esthetics, meeting the patient's expectations and addressing his complaints, including the failure of previous restorations. The prior restorative material was therefore completely removed to minimize the risk of failure, and a new direct composite restoration employing the BRB matrix technique was placed.

Absolute isolation was used to ensure an adequate, contamination-free working environment during the procedure; this step is fundamental to maintaining a moisture-free field and enabling effective application of adhesive materials. Moreover, isolation improves visualization of the operative field and protects the patient from accidental ingestion of materials or instruments. At the end of the restoration, finishing and polishing were performed with sanding discs, polishing points, and silicon carbide brushes to reduce porosities and achieve a smoother, glossier surface.

The adoption of the BRB matrix technique for the rehabilitation of fractured anterior teeth offers several advantages compared with conventional procedures. The BRB matrix allows more precise adaptation to the patient's dental anatomy, promoting more natural and long-lasting restorations (Pombo, 2019; Nieri et al., 2022). In addition, it facilitates controlled layering of composite cores, resulting in superior esthetic finishing with greater chromatic fidelity and translucency relative to the remaining teeth (Pombo, 2019; Nieri et al., 2022).

Clinically, the BRB technique yields a more predictable procedure that is less prone to failure thanks to its structured approach, reducing the need for rework and contributing to satisfaction for both patient and clinician. For the patient, the technique provides a functionally effective and esthetically pleasing restoration, with a positive impact on quality of life. Restoration of smile esthetics, together with recovery of masticatory function, also contributes to the restoration of self-esteem and psychological well-being.

Thus, the BRB matrix technique stands out not only for the excellence of its practical esthetic and functional results but also for its positive effect on quality of life by restoring the esthetic and functional integrity of teeth previously compromised by fracture.

FINAL CONSIDERATIONS

The use of the BRB matrix constitutes a practical method that facilitates the restorative process and reduces the number of clinical sessions, rapidly and effectively restoring esthetics and function for the patient.

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