

Esthetic Reanatomization in Posterior Teeth with Bulk Fill Resins: Case Report

Reanatomização Estética em Dentes Posteriores Por Meio de Resinas Bulk Fill: Relato de Caso

Kathyane Carvalho Alves^a; Rafael Pessoa de Lucena^b; Fábio Barbosa de Souza^c

^aUniversidade Federal de Pernambuco, Curso de Odontologia, PE, Brazil.

^bPrivate Practice, PE, Brazil.

^cFederal University of Pernambuco, Programa de Pós-Graduação Stricto Sensu em Odontologia, PE, Brazil.

*E-mail: fabiobdsouza@gmail.com

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Abstract

A constant appearance of new technologies and restorative materials has provided innumerable treatment options. Bulk Fill resins represent one of these options for posterior teeth. Better physicochemical properties, simplify use, wear resistance, possibility of single increment, less polymerization shrinkage stress are some of their advantages. These products would be suitable for simplified techniques, such as matrix technique that allows a better esthetic. The objective of this study was to describe a clinical report of multiple restorations in posterior teeth in association of occlusal matrix, diagnostic wax-up techniques and using single-increment technique of Bulk-Fill composites. The technique of occlusal matrix associated to the use of Bulk-Fill resin allowed aesthetic predictability for oral of rehabilitation using a single increment technique in cases of multiple restorations.

Keywords: Esthetics. Permanent Dental Restoration. Work Simplification.

Resumo

O surgimento constante de novas tecnologias e materiais restauradores vêm propiciando inúmeras opções restauradoras. As resinas do tipo Bulk Fill representam uma destas opções para dentes posteriores. Melhores propriedades físico-químicas, facilidade de uso, resistência ao desgaste, possibilidade de incremento único, menor contração de polimerização são algumas de suas vantagens. Esses produtos são adequados para técnicas simplificadas, como a técnica da matriz, réplica ou carimbo oclusal que permite melhor estética oclusal. O objetivo trabalho foi descrever um caso clínico de múltiplas restaurações em dentes posteriores por meio do emprego das técnicas de matriz oclusal e de enceramento diagnóstico, utilizando compósitos Bulk-Fill em incremento único. A técnica de matriz oclusal associada ao uso da resina Bulk-Fill permitiu previsibilidade estética para realização da reabilitação em casos de múltiplas restaurações.

Palavras-chave: Estética. Restauração Dentária Permanente. Simplificação do Trabalho.

1 Introduction

The increasing of new technologies including restorative materials has allowed aesthetic for anterior and posterior teeth. The composite resins present innumerable advantages when compared to other restorative materials. It shows the most cost-effective, fast technical execution and longevity with acceptable wear resistance, satisfactory adhesion to the remaining dental structure and good aesthetic properties¹. Therefore, it is difficult to obtain good dental contour and satisfactory occlusal anatomy. A perfect re-establishment of occlusion is important in order to provide long-term clinical success².

As a way of avoiding clinical consequences of shrinkage stress, incremental techniques are often chosen besides single-increment technique. A new composite resin was launched in the market. These materials have indication for posterior dental restorative treatment, well known as Bulk-Fill resins¹. Its use allows less work-time by decreasing the number of increments inserted into the dental cavity, since it permits

up to 4mm increments polymerization, when conventional composites permits increments with a maximum of 2mm³.

It is indicated for simplified procedures as the Matrix technique or Occlusal Stamp Technique⁴. The procedure consists on building a template before starting the cavity preparation in order to reproduce all anatomic details on the occlusal surface enabling the use of a variety of different materials, like acrylic resin². The matrix obtained is used when inserting the last increment, which corresponds to the enamel surface. This technique, not only simplifies the reproduction of occlusal morphology but it also decreases work-time without compromising the quality of restoration allowing functional, and aesthetical results⁴.

When the dentist faces a clinical situation where a multiple teeth restoration is needed. The occlusal guide is made under a previous molding and reproduction of the dental anatomy offering a more defined structure, correct contact spots, as well as the possibility of finalizing the procedure in a single session⁵. On the other hand, these procedures are expensive

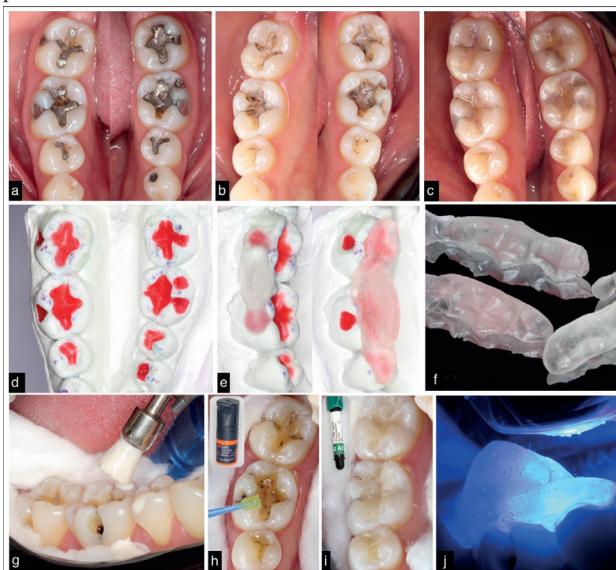
given to the laboratory procedures, making it unaffordable for mostly part of population. The creation of strategies to facilitate performing multiple restorations in a direct form becomes pertinent, and the use of a diagnostic wax-up represent an interesting method to the anatomy of the teeth

The aim of this article is to describe a clinical report of multiple direct restorations using the occlusal matrix and waxing diagnosis, inserting Bulk-Fill composites in a single increment.

2 Case Report

Patient L. F., female, age of 35, was reported to the Reception and Emergency Center of a Brazilian Dental School, needing replacement of amalgam restorations on posterior teeth of lower jaw. During the intraoral examination, fractures in the remaining restorations were observed (Figure 1a). The patient did not report pain or sensibility when dental elements were stimulated. The radiographic examination showed no radiolucent areas suggesting dental cavities.

Figure 1 - a) Defective restorations.; b) Cavity preparations; c) Temporary restorations; d) Diagnostic wax-up; e) Application of acrylic resin; f) Matrixes; g) Prophylaxis; h) Application of Single Bond Adhesive; i) Application of Bulk Fill resin; j) Resin photo-activation with matrix



Source: The authors.

The treatment plan was the replacement of metal restorations for composite resin using the association of the matrix occlusion technique, the waxing diagnosis technique and using Bulk-Fill composites in a single increment technique.

The defective restorations were replaced. The first step is local anesthesia, removal of the defective restorations in amalgam (Figure 1b) with spherical diamond burs 1012 and 1014 (KG SORENSEN, SP, Brazil) and after performing all preparation, the molding with addition silicone (Express/ 3M ESPE, St.Paul, MN) for lower and upper jaws, and occlusion registration with Lucia's JIG in red autopolymerizable dental

acrylic resin (Dencril).

Insertion of temporary restoration material, Bioplic (Biodynamics, PR, Brazil) (Figure 1c) was performed, followed by occlusal adjustments. Preparation of study models using dental stone type III, and mounting it using a non-adjustable Articulator using dental stone II was performed.

In dental cast waxing was performed using red wax (Kota) (Figure 1d) on restoring surfaces with the purpose of restorate the occlusal anatomies concerning the dental elements. After waxing was finished, the procedure of isolating the occlusal surfaces with solid vaseline and building the occlusal matrixes using autopolymerizable acrylic resin, VIPI, from insertion of powder and liquid using a paintbrush (Images 1e and 1f). In another session, it was performed local anesthesia, relative isolation with cotton rolls, prophylaxis of cavities with pumice stone paste, and water (Figure 1g), washing and drying.

After shade selection with a shade guide; Single Bond Universal Adhesive (3M ESPE, St. Paul, MN) was used in its strategy of self-etching. The adhesive was applied for 20 seconds (Figure 1h), followed by a 5 second jet air, and photo-activation for 10 seconds was performed using a LED device (Valo ULTRADENT – 1400 mW/cm²). After this stage composite resin Filtek Bulk-Fill A2 (3M ESPE) was inserted in posterior teeth, in one increment technique (Figure 1i), followed by the adaptation of the occlusal matrix with a thin layer of solid Vaseline, and photo-activation for 10 seconds on the occlusal face of each tooth (Figure 1j). After occlusal matrix removed (Figure 2a), a new photo-activation was performed on the vestibular and lingual surfaces on each tooth for 10 seconds.

After removing the relative isolation, the removal of excess resin and verification of dental occlusion contacts with carbon paper were performed (Figure 2b). After 48 hours, finishing polish was performed using a sequence of abrasive discs (Soflex Pop-on, 3M ESPE) with abrasive rubber points (TDV), obtaining the aesthetical restorations with proper functioning (Figure 2c).

Figure 2 - a) Aspect after occlusal matrix removal; b) Occlusal adjustment with carbon paper; c) Final aspect of the restoration



Source: The authors.

2.1 Discussion

The dental rehabilitation in posterior area has represented a challenge for dentists, due to the occlusal force applied in occlusal surface, it demands from restorative material mechanical properties compatible to clinical needs. According to Michelin et al.⁶, the progress achieved by physical, chemical and mechanical properties of the composite resins allowed the consolidation of its use in posterior teeth. In the case report presented the composite (Fitek Bulk-Fill) was applied using a single increment technique. According to Charamba et al.³, the Bulk-Fill type resins allow an effective polymerization of up to 4mm layers, since they show a more translucent aspect than conventional composite resins. As the transmission of light is related to the material's opacity, the acceptable 4mm degree of conversion from Bulk Fill composites should be given by its reduced opacity. This justify the final result in some of the teeth in this clinical case with small areas where dentin appears (Figure 3c). Referring to reproducing the color, it was observed that this kind of material has some limitations of shades produced by the manufacturer.

However, it is not able of compromising the final result by the fact of being located on the posterior area. This information associated with scientific evidences show a great clinical performance of Bulk-Fill composites in posterior areas^{7,8} justifying its use at the clinical case presented. Clinically, the use of Bulk-Fill composites has been an advantage to restoration of deep and narrow cavities that present difficult access angles because it makes the process easier and faster³.

The optimization of the consultations and the simplicity of procedures indicate a smaller number of clinical sessions in which patients will spend less time on the professional's chair. That was the principle applied on the clinic case presented. The use of Bulk-Fill resin itself would allow a faster procedure showing great advantage, lowering down expressively clinical time, and it is recommended for direct restorations in posterior teeth cavities⁹. In addition, making use of a self-etching adhesive reinforces a more simplified clinical practice. Single Bond Universal Adhesive was used in this report. On the composition of these systems, there are acid monomers that demineralize and infiltrate the substrates simultaneously¹⁰. The self-etching bonding agents have the advantage of reduction or eliminate the number of steps. Therefore, with the elimination of etching stages the technical sensibility is reduced promoting quality of bonding¹¹.

Even though the practical fundament guides the clinical sequence presented here, scientific evidences must prevail. This way, the use of relative isolation could be controversial. However, researches have shown that the absence of absolute isolation is not crucial for a good restorative clinical performance¹². It is important to assure that some characteristics promote the relative technique chosen: location of restorations in occlusal and vestibular surfaces, control of humidity using cotton rolls, control salivary secretion, work

with a dental assistance, a collaborative patient. Otherwise, relative isolation would be contraindicated¹³.

These advantages, it was decided to modify the conventional technique, in which an occlusal matrix is used to perform the cavity preparation, allowing an exact reproduction of the occlusal face of the teeth, forming a direct matrix. This technique is often used in cases of hidden cavities where there is no original dental anatomy. However, in the case presented the option was the substitution of restorations using the matrix obtained from reconstructed diagnostic wax-up in articulated models in order to re-establish occlusal anatomy and function.

According to Meirelles et al.¹⁴, the balance between form, function, and aesthetic are some of the main goals desired for Dentistry procedures. Under this perspective, the advantage of making the diagnostic wax-up is the possibility of enabling a detailed occlusal analysis promoting predictability in aesthetic results. This reflects on the clinical stage of making resin restorations, in order to minimize occlusal adjustments. Even when obtaining a reproduction of the anatomy planned on waxing, it wouldn't eliminate the need of restoration polishing. In the Filtek Bulk-Fill, it is observed nanohybrid particles that allow good polishing, smoothness on surface, brightness retention, and high abrasive resistance, besides the easy use of this material⁷. Even with all technologic achievements on restorative materials and developed techniques, these elements do not eliminate the need of clinical monitoring of these restorations. Therefore, the maintenance of the aesthetic restorations is inserted in a context of patient's oral health maintenance as well. The oral hygiene control, the periodic prophylaxis, as well as clinical re-evaluation of the conditions of these will promote the restoration's longevity.

3 Conclusion

The technique of occlusal matrix associated to the use of Bulk-Fill resin, allowed aesthetic predictability by the fact of reproducing the anatomy using the diagnostic wax-up, as well as optimizing chairside time.

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