



Clinical Performance of Pressed Ceramic Veneers: A Clinical Report

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Abstract

This article illustrates the clinical performance of pressed ceramic veneers when used in conjunction with bleaching. It is a case of aesthetic management of moderate dental discoloration. A 38-year-old female patient with a chief complaint of poor esthetics presented to the department of aesthetic dentistry. She was asking for the improvement of her smile. A comprehensive esthetic assessment showed moderate tooth discoloration, size discrepancy in the incisor region and minor malposition. Lateral incisor is fractured and restored with resin composite. A more natural appearance has been achieved using bleaching and pressed ceramic veneers. The result was esthetically acceptable and the patient was satisfied.

Keywords: Ceramic laminate veneers; Aesthetics; Bond interface; Smile; Pressed ceramics

Introduction

In aesthetic dentistry, the choice between direct and indirect technique is based on several criteria including the preservation of tooth vitality, minimum loss of sound tissue and aesthetic demands. Direct techniques provide the maximum preservation of residual sound tissue; they are indicated for the treatment of white spots and minor modification of color and shape. Ceramic laminate veneers, as indirect minimally invasive approach, represent a well-documented, effective and predictable treatment option with high rate success and provide remarkable advantages. A maximum esthetic result, due to high color stability, can be obtained. The control of teeth dimension, shape, layering, finishing and polishing procedures is also easy [1-3]. Several clinical factors including the optical properties, ceramic thickness, shade of the abutment and the luting agent are considered as a key of success. Adhesive cementation protocol is a critical factor for the long-term success of these minimally invasive restorations. A stable and lasting bond does not depend exclusively on the composite resin cement but, also, on an understanding of the bond interface with important involved factors including first, dental

substrate, second the ceramic material, third the resin material [4,5]. Leucite reinforced ceramic and lithium desilicated reinforced ceramic are the most used materials. They have greater bi axial flexural strength and fabricated through heat pressed techniques or CAD/CAM process. In terms of minimally invasive treatment options, perusable lithium dissilicate glass ceramic systems are valid, reliable and conservative restoration in the aesthetic zone [6]. Achieving aesthetic goals associated with high bond strength is directly associated with a solid knowledge of aesthetic guidelines including tooth anatomy, incisal edge position, proportions, as well as smile line and material properties [2].

Clinical Presentation

A 38 year old female patient, with a chief of complains of poor aesthetics, presented to the department of aesthetic dentistry of Monastir dental clinic. She was asking forth improvement of her smile. Firstly, preliminary analysis was performed and photographs were taken using CANON 700D Camera. Regarding the use of photographs, a verbal consent was obtained from the patient. In addition, data do not contain any personal detail

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showing the patient's identity. To assist the treatment planning, diagnostic casts and waxed-up restorations were previously obtained. Moderate tooth discoloration was diagnosed. Minor malposition was detected. Discrepancies in shape, form, and color were, also, observed. Fracture of the lateral incisor was evident; it was restored with resin composite (Figure 1). The treatment plan included bleaching and pressed ceramic veneers in maxillary 10 teeth. Bleaching was indicated to reduce the discoloration of teeth before preparation.

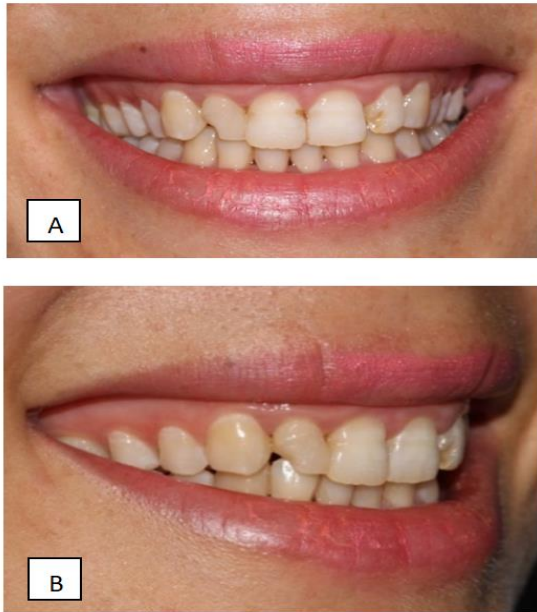


Figure 1: Initial situation showing unesthetic smile caused by tooth coloration and a gummy smile [A,B].

During the preparation, all margins were supra gingivally placed. A small amount of dentin was exposed and immediate Dentin Sealing (IDS) was performed (Figure 2).



Figure 2: Preparation design.

Chair side made provisional restorations were placed. Silicon material and retraction cords were used for impression. Ceramic veneers were performed with a lithium disilicate-reinforced glass ceramic material (IPS e.max Press, Ivoclar-Vivadent, Liechtenstein), using the heat press technique (Figure 3).



Figure 3: Ceramic veneers.

Etch – rinse technique was used for bonding. Optra stick was used to facilitate the final seating of the veneer with adequate pressure and to protect the external surface of the ceramic veneers was protected from etching. The fitting and internal surfaces of the veneers were etched acid for 1 min with 9% hydrofluoric and washed thoroughly; then were cleaned in distilled water for 5 min (Figure 4).

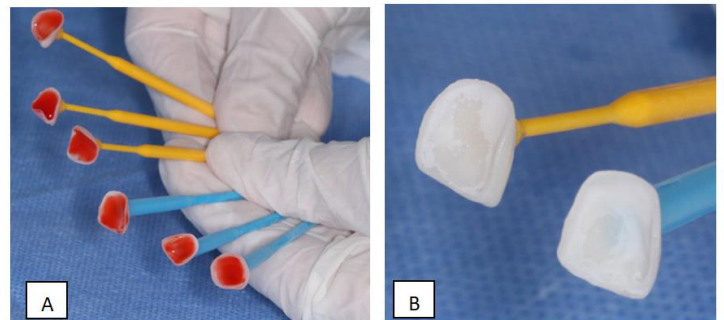


Figure 4: Surface treatment (A,B).

Etched surfaces were salinized. Adhesive resin was then applied but not polymerized. Tooth Dentin and enamel were etched, after preparations cleaning, with 35% for 10 s in dentin and to 30s in enamel. A multilayer of adhesive material was then applied on both the tooth and the restorations surfaces for 15s, air thinned but not polymerized (Figure 5).



Figure 5: Treatment of teeth surface (A,B).

Variolink material was applied on ceramic veneer and the restoration was placed with moderate pressure. Excess cement at margins was removed immediately. Tack-cured for 5 seconds to improve the stability of the restoration and facilitate the clean-up of excess luting composite. Final light curing of all veneers for 40 seconds was, then, performed. To avoid the fracture of fragile restorations, occlusal adjustments were performed after bonding.

The final result was esthetically acceptable and the patient was satisfied (Figure 6).



Figure 6: Final result (A,B).

Discussion

The primary goal of current aesthetic dentistry is to obtain healthy tooth structures integrated with biologic and long-term functional requirements. In this context, ceramic veneers have become popular for the improvement of anterior teeth appearance. Excellent clinical performance in terms of periodontal reaction, biocompatibility and color stability have been proved [4-9].

There are many conditions for clinical success including marginal adaptation, tooth preparation design, functional and morphological condition of the abutment tooth. In fact, optimal bond is obtained when the preparation is completely located in enamel; as enamel provides the most reliable substrate for etched porcelain laminate veneers [10].

Generally, there are three types of preparation design which are used for ceramic veneers: feathered incisal edge (window), butt joint or incisal bevel, and palatal chamfer. In this context, it is important to note that even for prepless veneers, incisal coverage can be increased and depending on the color of the remaining dental structure and the need of changing the form and texture of teeth with no severe discoloration, veneers of smaller thickness may be also indicated [11-13].

Based on different incisal coverage, studies in the literature showed the difficulty of finding clinical evidence on this issue. Up to now, one systematic review, conducted by Albanese Rafael Borge et al. and published in 2015, which has focused on incisal coverage in primary clinical studies. Its aim was to determine the survival of veneers with and without incisal coverage. They demonstrate that ceramic veneers showed high survival rates,

Irrespective of the preparation designs, with or without incisal coverage [14,15].

Bleaching may influence the extent of dental preparation and color selection. According to authors, it can be planned at the same clinical appointment with ultra-thin veneers based as veneers planned from the beginning. Color selection should be so delayed in such situation because bleached teeth appear, usually, whiter immediately after bleaching. In the present case it was performed 15 days before the preparation for color stability reasons [16,17].

The success of ceramic restorations is determined by the strength and durability of the bonding among the luting agents, ceramic material and the surface treatment of both ceramic and dental tissues [18]. High success rate for both feldspathic and glass ceramic laminate veneers was reported by Long term studies. Optical properties of lithium disilicate reproduce the polychromatism, translucency, resistance to fracture and compatibility. Veneers made out of pressable lithium disilicate glass ceramic material are routinely used. But, their Clinical performances are rarely documented [19-21]. Drs. Rinke and Ziebolz evaluated Heat-Pressed ceramic veneers at a mean time of 36 months after placement. Survival rates at 36 months were 95.1%, which is similar to results of other investigators [22].

According to literature, final aesthetic result depends on several factors such as the resin cement. This later improves mechanical properties of the restoration [23]. In the same context, correct surface treatment procedures should be carried out, in combination with suitable composite luting agent selection. Dentin bonding agents currently used are not yet able to prevent micro leakage at dentin margins which makes quality of the restoration inferior if dentin is largely exposed; when intra enamel preparation cannot always be achieved [24,25]. Scientists have suggested the application of multiple layers of SE adhesive to optimize bonding. Recent studies have demonstrated that 1 step self-etch (SE) mode exhibited similar bond strength results for enamel compared with the same universal adhesives in the etch rinse approach [26].

The use of light-cured materials for the cementation of veneers is based on the fact that the light could easily pass through the indirect restoration due its translucency and reduced thickness. Strazzi Sahyon et al, confirmed that the prior curing of an adhesive system inside ceramic laminate is not necessary. Singlewave and polywave light-curing units promoted no difference in color stability or the mechanical properties of the adhesive interface. Camillo D et al. Confirmed that the use of consistently supragingival preparation, cementation technique using a light-cured composite with the constant use of rubber dam isolation and a careful hand finishing was associated with high survival rates of porcelain veneers [25-28].

Conclusion

Ceramic veneers have demonstrated excellent clinical performance in terms of periodontal reaction and biocompatibility. Marginal adaptations, tooth preparation design, functional and morphological condition of the abutment tooth are mainly conditions for clinical success.

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