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The Use of Pre-Fabricated Composite Veneers to Enhance Esthetics

SUMMARY

Background: *This article is focused on the use of polymerized, pre-fabricated nano-hybrid-composite veneers to close diastema and to regain a vitality appearance of non vital discolored teeth.* ***Case Reports:*** *A 24-year old patient presented herself with a major complaint about the discoloration of her maxillary central incisors. The prefabricated composite veneers were recommended as the perfect solution in this case. Tooth shape and size was evaluated with the contour guide. Two pre-fabricated composite veneers size "M" were trimmed and cemented with the same hybrid composite resin that they were made from. A 28 year-old patient presented herself with a major complaint about her diastema. Her maxillary frontal teeth were intact. It was decided to use two veneers; size "L" and shade A2/B2 and Enamel Universal were chosen. Identical steps were followed ~~as~~ in clinical case 2.* ***Conclusion:*** *This new technique of treatment resulted to be an affordable way to regain esthetics. It is a one session treatment and requires no lab sessions, which makes it very comfortable for both dentist and patients. As with all new techniques, there is still a lot to be done, to confirm its effectiveness as a long term solution in esthetic dentistry.*

Key words: Veneers, Composite, Direct technique, Esthetics

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Introduction

Achieving an attractive smile requires so many different components interacting with each other like: the face, head and neck; facial structures and features; the nature, form, functions and condition of, in particular, the soft tissues of the lower third of the face, specifically the lips; the architecture and health of the gingival tissue; and last, but by no means least, the shapes, condition, shades, and function of individual teeth, and the dentition as a whole.

Designing beautiful smiles has been a challenge for many years and the "invention" of dental veneering has been a crucial feature of this challenge. While the "invention" of veneering anterior teeth by Dr. Pincus[1] was presented in 1937, it became more popular in the mid-seventies, using three different approaches: direct bonding using resin composites, prefabricated composite veneers and indirect, custom-made porcelain veneer[2]. In the late 1970 and early 1980s, this technique was followed and improved by Rochette[3]. Dentistry has changed dramatically over the past 30 years and this process has been catalyzed by various factors. There are lots of other options for achieving a beautiful smile such as: full metal-ceramic restorations, all-ceramic restorations and other direct techniques.

Traditional restorations such as metal-ceramic have predictable strength and a history of long term success, but typically less than ideal esthetics. The increasing demand of patients for the improved esthetics has driven the development of all ceramic systems. These systems have grown exponentially with the development of esthetic and biocompatible ceramics. The absence of metal allows a natural transmission of light through the restoration, improving the appearance of the gingival margin tissue.

Direct esthetic restorations require careful techniques combined with creative and artistic skills and considerable chairside time. Indirect techniques using laboratory manufactured restoration outsource the skills to provide

an esthetic restoration, and may improve the long term performance. In comparison to direct procedures, indirect approaches traditionally require more tooth preparation to create the space required for the necessary thickness of material and to prevent over-contouring, and it will cost more because of extra appointment, temporary restoration and laboratory fee.

The newest generation of composites used indirectly in the anterior region has shown some promising results like supporting mechanical stress adequately, an excellent esthetics and the possibility of the intraoral reparation[4].

Nowadays, direct techniques have improved a lot with the new generation of composites giving us the possibility to use the pre-fabricated composite veneer systems. This kind of veneers (Mastique®, Caulk) was explored about 35 years ago, using a methyl-methacrylate matrix and large glass fillers, such as used in resin composites but with limited success due to technological limitations and poor surface qualities[5]. This paper is mostly focused on the use of a new generation polymerized, pre-fabricated nano-hybrid-composite veneers, to close diastema and to regain a vitality appearance of non vital discolored teeth.

Case presentation

After taking a detail patient history, the goals of esthetic dental care were set and they included the following:

1. Meet the realistic expectations of the patient,
2. Obtain long term functional and esthetic stability,
3. Achieve the treatment goals through the application of minimal intervention approaches,

Clinical Case 1

A 28-year old healthy female patient presented herself with a major complaint about the discoloration of her maxillary central incisors (Figure 1). She also requested the bleaching of her teeth and an overall improvement of the appearance of her smile. After a careful clinical examination and taking patients' medical history a radiographic assessment was performed. Her maxillary central incisors were endodontically treated, and restored with the direct composite veneers. Patient's oral hygiene and periodontal tissue status were excellent.

The ideal treatment was all-ceramic crowns, but due to financial limitations and requested tooth preservation, prefabricated composite veneers were recommended as the perfect solution in this case. Tooth shape and size were evaluated with the contour guide, size "M" (Figure 2). Prior to determining the dentin shade, a dental bleaching (Figure 3) was performed to achieve the desired shade for the patient. After 3 weeks, the Synergy D6 color guide (Figure 4) was used to determine the dentin shade A2/B2 and the enamel shade White Opalescent. After tooth preparation, two pre-fabricated composite veneers were trimmed with abrasive discs (SwissFlex, Coltene) (Figure 5) and tried in to match the size and shape of the desired restoration. Phosphoric acid (35%) was used to etch the tooth surface and One Coat Bond was used as the adhesive system included in the Componeer system. After the placement of the retraction cord, the veneers were cemented with the same hybrid composite resin that they are made from (Figure 6). Finishing and polishing strips were used for interproximal areas and flexible abrasive discs (3M/ESPE) were used for the incisal edge.

Figure 1. Preoperative view

Figure 2. Componeer contour guide

Figure 3. Clinical view after dental bleaching

Figure 4. Componeer Synergy D6 shade guide

Figure 5. Trimmed veneers

Figure 6. Postoperative view

Clinical Case 2

A 28 year-old female patient presented herself with a major complaint about her diastema and the position of her maxillary central incisors (Figure 7). A careful clinical examination revealed a healthy patient with a perfect oral hygiene (Figure 8). Her maxillary frontal teeth were intact without any restoration so the treatment options were easy to discuss. Due to financial limitations, pre-fabricated composite veneers were chosen as the perfect option. It was decided to put two veneers on the maxillary central incisors to minimize the diastema and to align them. Total closure of the diastema was not recommended as it would result in large and unaesthetic maxillary incisors. Size "L" was chosen with the help of contour guide and A2/B2 was chosen as the appropriate dentin shade, while the enamel shade was Enamel Universal. Identical clinical steps were followed as in clinical case 1 including: tooth preparation, isolation, retraction cord placement, etching, rinsing, adhesive application and final veneer cementation (Figure 9 and10).

Figure 7. Preoperative retracted view

Figure 8. Preoperative non-retracted view

Figure 9. Postoperative retracted view

Figure 10. Postoperative non-retracted view

Discussion

According to Wilson[6] there are three categories of "dental esthetic imperfections" that encourage patients to seek esthetic interventions. These relate to anomalies in tooth: color, position, shape. Besides these three main anomalies in our daily practice we face several challenges such as: to lengthen anterior teeth, to correct malpositioned teeth, to mask discoloration, to close diastemas, to restore extensive caries lesions and tooth fracture, to correct large, old anterior restorations. When other treatment options are out of reach for the patients, pre-fabricated composite veneers should be recommend.

Pre-fabricated composite veneers are available in different shades and sizes which matches the requirements of the patients. One of the major advantages of pre-fabricated composite veneers is one-visit appointment, which lowers the extra cost for provisional restorations or laboratory procedures. They are easily finished and polished and can be repaired intra-orally. There is still need to perform additional studies for mechanical and esthetic properties of these veneers as technology improves every day especially comparing direct and indirect veneers and the materials they are made of.

A study which evaluated 318 ceramic veneers in 84 patients over 10 years concluded that porcelain laminate veneers offer a predictable and successful restoration with survival probability rate of 93.5% over 10 years. Bruxism and nonvital teeth were associated with significantly increased failure rates, and discoloration of marginal part of the restorations were worse in patients who smoked[7]. Nonetheless, it was established that the type and location of the restoration are two determining factors for the marginal integrity of the restorations[8].

As the esthetic potential of composite veneers is much better to the metal ceramic restorations, it is often possible to place the margins of composite restorations supragingivally or equigingivally. These locations of the margin simplify the restoration preparation, with the additional benefit to the periodontal health. Furthermore, emergence profiles are less likely to be over-contoured as is commonly.

Contouring and shaping of the restoration complete the primary anatomy. Polishing produces a smooth light reflective surface. This prevents the plaque accumulation, resists staining and improves marginal adaptation, enhancing the longevity and esthetics. To contour the primary anatomy and finish margins, the multi-fluted carbide and diamond burs may be used, followed by the abrasive and polishing devices including discs, strips and paste. The overuse of polishing discs can lead to the flat profile of the final surface. The judicious use of the rotary burs and discs along the line angels of the tooth and coping of the convex labial contour of the teeth will allow a natural tooth surface that will reflects lights correctly and has the correct form.

Despite being a less expensive treatment option, pre-fabricated composite veneers are good treatment choice from a biological point of view as the wear of the antagonist enamel is less than ceramics[9]. A lot of studies evaluated either the survival of only ceramics or the resin composites as veneer material, without their comparison. There is no reliable evidence to show a benefit of one type of veneer restorations over the other with consideration of the restoration longevity [10].

There is little information about long term survival of different indirect laminate systems[11]. The technique and materials described in this paper remain a very good option for our patients. It can be used to close diastemas, to regain symmetry of the shape of frontal teeth, to restore a vital look to non vital teeth, to align malpositioned teeth. If this system is properly used, according to the system guidelines, it can achieve very good results which can be beneficial for both professionals and patients.

Conclusions

This new technique of treatment resulted to be an affordable way to regain esthetics. It allows the practitioner to use this technique in a various number of cases. It is a one session treatment and requires no dental laboratory appointment, which makes it very comfortable for both dentist and patients. As with all new techniques, there is still a lot to be done, to confirm its effectiveness as a long term solution in esthetic dentistry.

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