ESTETİK SORUNLARIN ÇÖZÜMÜNDE PORSELEN VENEERLER VE TAM SERAMİK RESTORASYONLAR: OLGU SUNUMLARI

PORCELAIN VENEERS AND FULL CERAMIC RESTORATIONS FOR RESOLVING ESTHETIC PROBLEMS: CASE REPORTS

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Özet

Estetik restorasyon ihtiyacı olan genç erişkin hastaların tedavi planlamalarına ait farklı görüşler hala günümüzde mevcuttur. Seramik materyaller ve yapıştırıcı ajan teknolojilerindeki gelişmeler ile "minimal invaziv dişhekimliği" adına, seramik restorasyonlar, doğal dişlere başarılı bir şekilde yapıştırılarak tedaviler sağlanmaktadır. Restoratif sistemler içerisinde, porselen laminate veneerler öngörülebilir ve uzun süreli estetik sonuçlar verebilen en konservatif tedavi yaklaşımlarından biridir. Ancak, dişlerde aşırı düzensiz eğimler, geniş diastemalar ya da eski restorasyonlar varsa, bu durumda tüm kronlar daha iyi bir seçenek olacaktır. Ayrıca, anterior bölgede silikat seramikler, porselen laminate veneer ve kronların uygulanmasına olanak sağlarken, posterior bölgelerde, oksit seramikler, özellikle de zirkonyum oksit seramikler uygulanabilmektedir. Bu olgu raporu, seçilen iki vakada arzu edilmeyen ve kaybedilmiş estetiğin, porselen laminate veneerler ve silikat ve zirkonyum seramiklerle hazırlanan tam seramikler ile yeniden hastalara kazandırılmasını anlatmaktadır.

Anahtar Kelimeler: Porselen laminate veneerler, tüm seramik kronlar, lityum disilikat seramikler, zirkonyum oksit, diastema kapatılması.

Abstract

Controversy persists regarding the treatment planning criteria for young adult patients in need of esthetic restorations. With the improvement of ceramic materials and bonding agent technologies, ceramics are successfully bonded to natural teeth conceptualizing toward minimally invasive dentistry. Within the restorative systems, porcelain laminate veneers are considered as one of the most conservative modalities with long-term esthetic and predictable results. However, if the teeth are already compromised by the presence of unfavourable inclinations, wide diastemas, or old restorations, a full coverage crown would be a better option. In addition, silicate ceramics allow porcelain laminate veneers and crowns to be used in the anterior region, while for the posterior areas, oxide ceramics, specifically zirconium oxide is preferred. The present report illustrates the esthetic rehabilitations of two selected cases to return their unpleasant and lost esthetics by using porcelain laminate veneers and all ceramic restorations made of silicate and zirconia ceramics.

Key words: Porcelain laminate veneers, full ceramic crowns, lithium-disilicate ceramics, zirconium-oxide, diastema closure.

Introduction

Dental appearance has been judged to be an important indicator when assessing facial attractiveness, with physical beauty being a significant factor in a person's well-being (1-4). Accordingly, patient demands and expectations of resolving dental esthetic problems in the esthetic zone are steadily growing (5). Today, modern materials and adhesive techniques have innovated esthetic dentistry towards restorations which are truly invisible and unique to the patient (6-9). Especially, for patients with a high smile line, harmonious and natural looking reconstructions are crucial since a direct vision of the restoration is possible (10). When dentists are considering restoration of maxillary anterior teeth to improve esthetics, they often face to make a decision between porcelain veneers and full-coverage crowns (11). With the improvement of ceramic materials and luting agents, porcelain laminate veneers (PLV) are successfully bonded to teeth, conceptualizing towards minimally invasive dentistry (6,12,13). PLVs are considered much more conservative in terms of the requirements for preparation, and they provide satisfactory, long-lasting esthetic results (11). However, if the teeth are with unfavourable inclinations and wide diastemas, or already compromised by the presence of extensive carious lesions, wear, old

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restorations or endodontic treatment, placement of a crown is the more prudent choice (11, 14).

In addition, with the appearance of all-ceramic systems providing a choice of framework porcelains and allowing the same material to be used for the veneer, it is now possible to select the ideal structure in terms of both functions and esthetics. Silicate ceramics allow PLVs and crowns to be used in the anterior region, providing excellent esthetics, while for the posterior area where function takes place, zirconium oxide ceramics are preferred (15).

This article presents the treatment options of two young adult patients to return their unpleasant and lost esthetics by using lithium-disilicate ceramic veneers and crowns for the anterior areas, and a zirconium-based ceramic crown for the posterior region.

Case Reports

Case 1

A 37 year-old female patient presented with a chef complaint of unattractive smile (Fig. 1a).

Figure 1a. Frontal view of the anterior teeth. The teeth are dark with old composite restorations.

Clinical examination revealed that the maxillary incisors had abrasions and colored composite resin fillings. The right I. premolar had an old metal-ceramic restoration. The patient had a high lip line and the patient's smile line was including the II. premolars. The patient was offered several treatment options. The first option was bleaching upper and lower front teeth and renewing the old restorations. As the patient was a smoker, she did not interested in bleaching because of the fact that smoking would change teeth color. Because the maxillary anterior teeth had small composite restorations, and the lower anterior teeth were caries- and restoration-free, the relatively aggressive option of full-coverage crowns was not considered. The patient elected to restore the upper and lower anterior teeth with PLVs, and the right I. premolar with an all-ceramic crown. The old restorations were first removed and new tooth color composite fillings were placed. The teeth were then prepared for ceramic restorations. The PLV preparations were made with enamel reductions of 0.4 - 0.5 mm supragingivally. For the incisal overlap, the incisal edge was reduced by 1 mm, and a 1.0-mm-deep and 0.5-mm-wide butt joint was preferred on the incisal/ palatal side. A 1.5 mm axial and 2 mm incisal reduction with chamfer finish line design was made for the right I. premolar. Polyether impressions (Impregum, 3M ESPE, Seefeld, Germany) were made with customized acrylic resin trays (LeadDent, Germany). Jaw registration was performed and a face-bow registration was obtained (Artex, Amnn Girrbach, Germany). Provisional restorations were immediately fabricated intraorally (Tempofit, Detax GmbH Co., Ettlingen, Geramny). Final casts (Sheraalpin, Shera Werkstoff-Technologie GmbH Co., Lemförder, Germany*)* were then articulated on a semi-adjustable articulator. The PLVs (IPS Empress 2, Ivoclar, Schaan, Liechtenstein) and zirconia-based ceramic crown (IPS e.max, Ivoclar, *Schaan*, Liechtenstein) were prepared in the laboratory (Figs 1b and1c).

Figure 1b. Nine porcelain veneers and a zirconium-oxide crown were fabricated for the maxillary teeth.

Figure 1c. Mandibular laminate veneers placed on the cast model.

During the try-in, the patient's expectations and perception of the restorations concerning teeth color, form, and position were considered, and the necessary modifications and characterizations were undertaken. The restorations were acid-etched, silaneted and finally cemented to the acid-etched natural teeth using resin cement (Kuraray, Osaka, Japan). Excess cement was carefully removed, and the patient was highly satisfied with the final result (Figs. 1d, 1e and 1f).

Figure 1d. Post-operative appearance of the patient.

Figure 1e. Lingual view of the mandibulary anterior teeth after cementation of the ceramic veneers.

Figure 1f. Patient' s smile.

The patient was instructed on the maintenance of interproximal gingival health with the aid of dental floss and mouth wash.

Case 2

A 33 year-old female presented with esthetic concerns regarding the diastemas in her upper and lower anterior teeth (Fig. 2a and 2b).

Figure 2a. Preoperative facial view of the Case 2.

Figure 2b. Right lateral view of the patient. Wide diastemas of the maxillary incisors and the missing mandibular incisor are clearly visible.

Clinical examination revealed that the lower right I. incisor was missing. There were 2-3 mm gap on each side of the II. incisors with

the adjacent teeth. The patient was not interested in orthodontic treatment because of the estimated length of the course of treatment and the fact that she would need fixed appliances. Also an implant for the lower incisor was rejected because of the duration and the cost of the treatment. The patient elected the prosthodontic rehabilitation of her anterior teeth with PLVs, crowns and a bridge. Because the stresses mainly concentrate on the free extentions of PLVs (14), it was decided that the most appropriate treatment for this patient would be to provide full coverage crowns for the upper II. incisors, a three-unit all-ceramic bridge for the missing lower I. incisor, and PLVs for the rest of the anterior teeth. The literature contains good evidence of the reliability survival of non-metallic crowns and bridges when used on the anterior teeth (11). The preparations, impressions and casts were made similar to the Case 1. The lithium-disilicate PLVs, crowns and a three-unit- bridge were prepared with the IPS Empress 2 (Ivoclar, Schaan, Liechtenstein) system. The ceramics were then cemented adhesively to the natural abutments (Figs. 2c and 2d).

Figure 2c. Appearance of the teeth after cementation.

Figure 2d. Lateral view of the patient postoperatively.

By two weeks after cementation, the gingival tissues had recovered completely and there was a dramatic improvement in esthetics.

This restoration has been successful for over 3 years.

Discussion

The two patients presented in this article are examples of major dilemmas in the esthetic zone. In the first case, the patient presented old composite fillings and attrition of the front teeth. PLVs were selected because they are considered much more conservative. A palatal overlap preferred to the window technique for the veneer preparation. It has been shown that the palatal overlap develops less stress than the window veneers. The palatal aspect is exposed to compressive forces (6). In addition, the lithium-disilicate ceramics were used for the fabrication of the veneers due to their excellent esthetic advantages. However, for the premolar area, by giving precedence to strength over esthetics, the IPS e.max ZirCAD framework was chosen. This has an opaque component; visible in areas of thin ceramic veneer and greater core thickness (15).

In second case, the second incisors were restored with full ceramic crowns. Earlier studies have shown that the stresses mainly concentrate on the free extentions of PLVs; therefore, a crown design was preferred to PLV for the long-term survival of the restoration. In addition, silicate ceramics present connector fracture rates up to 30 % and should therefore be selected with caution, being used only in the anterior group (15-17). In this case, the manufacturer's recommendations were fully respected with regards to connector thickness, the area in which the majority of the fractures occurs (15,18). Within the 3 year-period, no connector fracture was observed.

When considering treatment of the anterior teeth for esthetic purposes, every case should be considered on its own merits in terms of potential costs, risks, and benefits (11). The use of crowns may be beneficial in terms of providing support to abutment tooth, preventing the crown for future failure and achieving a positive and predictable long-term prognosis for the restoration (11). However, the trend of conservative treatment continues to become widely acknowledged (19). Especially for young adult patients, it is important to preserve as

much tooth structure in place as possible and to retain natural teeth to maintain the architecture of soft tissue and thereby facilitate the retreatability of the restorations (16). It is recommended that a conservative approach be used whenever possible as an alternative to treatment options that may sacrifice tooth structure (19,20).

The two cases presented demonstrate the esthetic dilemmas that clinicians may face during their daily practice. As the use of PLVs and zirconia restorative components with all-ceramics are becoming common and predictable with increased research, these clinical case reports may help the clinicians in the decision of selecting the proper treatment modalities.

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Laboratory Procedures: Murat Özmel, Dental Estetik, Ankara, Turkey

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