Case Report

Prosthodontic Rehabilitation with Laminate Veneers: A Case Report

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ABSTRACT

One of the most crucial issues in modern dentistry is restoring a patient's lost dental esthetic appeal. To accomplish this goal, new treatment materials and techniques are being developed on a daily basis. For anteriors where esthetics are crucial, the majority of dentists favor more conservative and esthetically pleasing methods, such as direct and indirect laminate veneer restorations, over full-ceramic crowns. Laminate veneers are restorations designed to address discolorations, esthetic deficits, and existing anomalies. There are two methods for processing laminate veneer restorations: direct and indirect. Direct laminate veneers, which are based on the idea of applying a composite material directly to the prepared tooth surface in the dental clinic, do not require laboratory preparation. Composite materials or ceramics, which are bonded to the tooth with an adhesive resin, can be used to create indirect laminate veneers.

Key words: Computer-aided design/computer-aided manufacturing designing, Conservative, Diastema, Esthetics in dentistry, Laminates

INTRODUCTION

The Greek word "esthetics" comes from "Aesthesia," which means dealing with beauty or the appreciation of beauty. Dental esthetics, as established by Pilkington in 1936, is the study of emulating or balancing art with nature to make it less noticeable. In adulthood, the persistent diastema between the maxillary central incisors is sometimes considered a malocclusion or esthetic issue. The distance (or gap) between the maxillary central incisors is known as the midline diastema.[1] When the maxillary canines erupt, the space is usually closed and may be a normal growth characteristic during the primary and mixed dentition.

According to Broadbent, the maxillary lateral incisors and maxillary canines' medial erupting course cause this area to close normally in the majority of youngsters. However, the diastema does not close spontaneously.[2] Contemporary dentistry ought to align with the principles of biomimetics or bioemulation. The use of biomimetic and emulation concepts has led to a substantial evolution in modern dentistry. Good mechanical, biological, and esthetic principles are essential to the repair process' effectiveness. When esthetic adhesive restorations in the anterior region are needed, several treatment alternatives may be taken into consideration, including metal-free crowns (lithium disilicate, zirconia, and alumina), composite or ceramic laminate veneers, and direct composite restorations.

When it comes to making anterior teeth seem better, laminate veneers are a more conservative option than full-coverage restorations. They have become the most common restoration in esthetic dentistry during the past few decades.[3,12] When laminate veneers are applied correctly, they can change a smile in a conservative, painless, and effective way with long-lasting effects. Their final surface closely resembles that of genuine teeth, and they also exhibit a great tissue response. A veneer is a thin coating of tooth-colored material that is put on a tooth to treat inherent discoloration and localized or widespread flaws.[4,10] Direct and indirect laminate veneers are the two varieties of laminate veneer restorations.

In the dental clinic, direct laminates are directly put using a composite resin substance to prepare tooth surfaces. Some benefits of this procedure include the lack of requirement for tooth preparation, lower patient costs as compared to treatment reversibility, indirect methods, and other prosthetic procedures, and removing the requirement for an extra adhesive cementing system. Compared to indirect laminate veneer restorations, direct laminate veneer restorations have superior marginal adaptability, are simpler to polish intraorally, and can have any cracks or fractures repaired intraorally. However, direct laminate veneers have little resilience to fracture, discoloration, and wear.[11]

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Because less than half of the enamel is removed during tooth preparation, leaving the remaining area intact before veneer insertion, veneer is regarded as one of the most conservative surgical treatment techniques. Similar to the natural tooth structure, veneers absorb, reflect, and transmit light with natural fluorescence.

Simple preparation and careful reduction of sound tooth structure must be followed in restorative cases.[5,9] The purpose of this essay is to demonstrate minimally invasive diastema closure techniques.

CASE REPORT

The primary complaint of a 34-year-old female patient who sought cosmetic rehabilitation for the spacing in the upper front teeth area [Figure 1] was brought to the attention of the prosthodontics department. In addition to diagnostic impressions and radiographs, including intraoral periapical radiographs and orthopantomogram, a patient's case history was obtained. A localized diastema between two maxillary central incisors and between maxillary and lateral incisors on both sides was discovered during inspection.

The main goal of the treatment was to close the diastema using the least intrusive method possible. The four maxillary anterior teeth were scheduled for veneers. The patient has explained the course of treatment.

Tooth preparation

The labial surface was prepared by making depth orientation grooves (gingival half) using a three-wheel diamond depth cutter (0.3 mm). A three-wheel diamond depth cutter (0.5 mm) was used to create the depth-orientation grooves on the incisal half. Cuts at a depth of 0.5 mm were made on the tooth's incisal surface. In an incisal butt-joint preparation, the incisal surface was diminished [Figure 2]. The round-end tapered diamond bur was used to prepare the lingual finish line. The instrument was held parallel to the lingual surface, and its end formed a chamfer that was 0.5 mm deep to prepare the lingual tooth. A round-end tapered diamond was used to remove sharp features that would have formed where the lingual, proximal, and facial planes of preparation intersect. The final preparation [Figure 3] was free from any sharp line angles.[6,8]

After the preparation of teeth, digital impressions [Figure 4] were made using the dentsply sirona intraoral scanner.

The temporary restoration was given using polymethyl methacrylate acrylic resin irt 12, 11, 21, and 22.

Computer-aided design/computer-aided manufacturing designing [Figure 5] was done using EXOCAD version 1.6.15 software, and IPS e.max Press (lithium disilicate) laminate veneer [Figure 6] was fabricated.

The final prosthesis was then tried intraorally [Figure 7] and luted permanently [Figure 8,9] using resin cement (Ivoclar variolink dual curing resin bonded luting cement).[7]

Figure 1: Pre-operative frontal view

Figure 2: Butt-joint preparation

Figure 3: Teeth reduction irt 12, 11, 21, and 22 with wrap-around preparation

DISCUSSION

Both direct and indirect laminate veneers have grown in popularity as esthetic treatment choices in recent years for individuals who have esthetic issues with their anterior teeth. Cost, societal impact, and time limits are important considerations when deciding between these two solutions. Ceramic laminate veneers have several drawbacks, such as increased expenses and longer chair times, despite their benefits, which include superior color stability and strong abrasion resistance.[4]

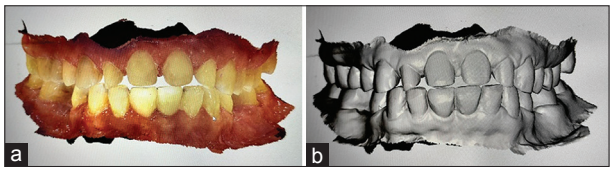

Figure 4: Digital (a)impressions (b) scan of prepared teeth

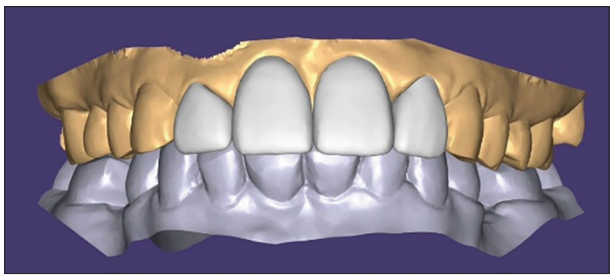

Figure 5: Digitally designed prosthesis

Figure 6: Final fabricated prosthesis

Figure 7: Try-in

They also have particular issues, such as the requirement for more sticky cement. The inability to hide the discolored dental tissue underneath due to the shallow preparation depth, particularly at the cervical region, the long chair time needed to repair simple fractures, incorrect indications, difficulties coordinating between the dentist and technician during shade harmonization, and simple negligence during cementation are also important issues that still need to be addressed. Composite resins are now more esthetically pleasing, address previous issues, and enhance physical attributes

Figure 8: Cementation of the prosthesis using resin-bonded cement

Figure 9: Post-operative occlusal view

in place of laminate veneer coatings. Conservative treatment methods are very crucial in modern dentistry. Therefore, one of the finest treatment alternatives is a composite laminate veneer repair, which requires the least amount of tooth structure removal.

Since direct composite laminate veneers are significantly less expensive than ceramic veneers and do not require lengthy laboratory procedures, they are becoming more popular. Benefits include the ability to have just one appointment for the entire treatment duration.[5]

Compared to indirect composite laminate veneers and ceramic laminates, direct composite laminate restorations are still less resistant to abrasion and fracture. Furthermore, because polymerization takes place outside the oral cavity, indirect composite laminate veneer restorations are superior to direct composite laminate veneers because ceramic laminate veneers have higher color stability and are less impacted by oral cavity fluids. Although direct laminate veneer restorations still have some disadvantages, especially discolorations and fragility, thanks to the development of new composite resins, they can be a treatment option for patients with esthetic issues of the anterior teeth when used sparingly and with a strong emphasis on maintaining good oral hygiene.[6]

CONCLUSION

One of the most common esthetic repairs is porcelain laminate veneers. Despite being among the most conservative treatment methods, there are several guidelines that must be adhered to. Excellent communication between dentists, patients, and ceramists is essential for the objective study of esthetics.[3] Treatment planning and case selection must be done with care. Using mock-ups, followed by a silicone index and wax mock-up, enables us to improve phonetic, cosmetic, and functional results as well as communication between the laboratory and the patient. The best part, though, is that the recipient's tooth needs very little preparation.[7]

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