(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 5, Issue 2, Page No: 851-855
March-April 2022

IJMSCR

Esthetic Rehabilitation Using Indirect Veneers – A Case Report

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Type of Publication: Case Report
Conflicts of Interest: Nil

Abstract:
In cosmetic dentistry, there are various treatment options that can be proposed according to the esthethic aspirations of the patient. Indirect veneers exhibit colour stability and stain resistance. Placements of veneers usually take two appointments. In the first appointment, diagnostic impressions are made, shade selection is done, tooth preparation is carried out and impression is taken and in the second appointment after the removal of temporary restoration, a try in of the veneers are done followed by their cementation. Case selection, tooth preparation, placement of veneers, its cementation and patient motivation and co-operation are hallmarks of longivity in case of veneers.

Keywords: Korner's Cosmetic, Esthetics, Indirect, Tooth Preparation, Veneer

Introduction

Esthetic standards set forth by the society and the desire to achieve an attractive smile has encouraged patients to search for rearrangements to improve their physical appearance. One of the biggest challenges for dentists to provide an ideal smile is when the patient presents with inadequate tooth size or malalignment, which may lead to undesirable teeth display. [1-2]

The porcelain-bonded restoration comprises of mainly four components

1. Porcelain veneer that is etched internally
2. Feasible tooth surface.
3. Silane-coupling agent
4. Luting resin cement

Porcelain exhibits high durability, strength, hardness, glassiness, translucence and higher resistance to attack by chemical solutions. As it is evident from the case shown, skilled hands with the help of dental porcelain can make an amazing imitation of the tooth by perfectly mimicking the tooth enamel that greatly enhance the smile. [3]

Strudevant described veneer as a layer of tooth coloured material that is applied to the surface of tooth to aesthetically restore the localized or generalized defects or the intrinsic discolourations. There are several treatment options that can be applied depending of the final esthetic appearance of the dentition. Full crowns remove unnecessary tooth structure and hence more conservative options like veneers are preferred to camouflage tooth discolouration. [4]

The major limitations of composite veneers is that they have short life span and are susceptible to discoloration, marginal fracture and wear which reduces the longevity of esthetic results. This was overcome by porcelain veneers. [5] Placement of the veneers usually take two appointments.

Case report:

A 21 year old female patient reported with the chief complaint of discolored upper front teeth since her

childhood. On extra oral examination, the teeth were brownish with white patches enveloping the incisal and facial surfaces of upper front teeth. They were discrete, confluent white spots. The case was diagnosed as moderate dental fluorosis. (Fig 1)

Indirect Ceramic Veneers (overlap type) were planned for teeth 13-23. On the first visit the treatment plan was explained and pre-operative pictures were taken. Pre and post treatment pictures help the clinician as well the patient to appreciate the treatment outcome. A clear treatment planning is critical to understand the overall progress and prognosis of the whole treatment. Wax-up of the patient's cast can assist in the desired aesthetic appearance, to create putty index for temporaries and used as reduction guides during preparation.

The final shade of veneers is a combination of the underlying color of the tooth, the degree of translucency or opacity of the porcelain used in fabrication and the luting resin. In the following patient, B1 shade was selected and tooth preparation was done in the six teeth that were supposed to receive the veneers.

Tooth preparation is done to achieve the following:

a) Preparation should be within the enamel.

b) The finished preparation should be free of sharp line angles and smooth to reduce stress concentration.

The preparation of the buccal aspect of the incisors need to be addressed in two planes with facio-gingival and facio-incisal margins. This provide sufficient space for restoration, both in incisal and shoulder area. A careful labial reduction was carried out to provide a minimum of 0.3 to 0.5. A two planer reduction is required for the facial aspect; one that is parallel to the path of insertion, and one that is parallel to the incisal two thirds of the facial aspect. Only one planer reduction might result in an insufficient space in the incisal third for porcelain. Three horizontal depth cuts were prepared on the labial surface using a three tiered depth cutting diamond point bur. The depth cut was used as guide and the labial surface of the tooth was prepared to prevent over reduction (0.3-0.5 mm). Inter proximally the clinician should stop the preparation before the contact area, if the contour of the tooth does not need to be changed, for example in a labially placed tooth. The preparation of cervical portion of the veneer should be a chamfer design with maximum depth being 0.4 mm. A 2 mm incisal reduction was done. After the placement of retraction cord, a final putty impression was taken with Heavy Body and Light Body (Dentsply Aquasil). The impressions were sent to the laboratory for fabrication of the veneers. Temporary restorations were given and the patient was recalled.

Once the ceramist has sent the veneers (Fig 2), provisional restorations should be removed and debris should be cleared off for precise adaptation of the veneers. Each veneer should be tried on to the tooth individually to assess its fit. (Fig 3) Once the patient has approved the final esthetics, the veneers can be prepared for cementation. The inner surface of veneers was etched with 5% hydrofluoric acid for 60 seconds and cleansed thoroughly with air-water spray. Veneers were air dried and silane primer was applied to the bonding surface; this helps to provide a means for chemical covalent bond to the ceramic. Teeth were first thoroughly cleaned with polishing paste and then etched with 37 % phosphoric acid gel for 30 seconds and were cleaned properly thereafter. Bonding Agent Tetric N Bond was applied and light cured. Resin cement (light cure) was applied on the veneer restoration and then was seated on the prepared tooth with a gentle force. After initial curing, all the excess cement around the margins were carefully removed and cleaned up with a #12 blade. Oxygen inhibition gel was applied and the final curing was done. Occlusion was checked first in centric occlusion and then by excursive & grinding movements. The margins are polished with polishing burs and discs. Post-operative instructions were given to the patient. One month follow up picture is shown in Figure 4.

Discussion:

Case selection, tooth preparation, placement of veneers, its cementation and patient motivation and co-operation are hallmarks of longevity in case of veneers. There are four types of incisal preparations that can be done for veneers: a) window, b) feather, c) bevel or d) incisal overlap. In the incisal overlap preparation, the incisal edge is reduced and then the preparation is extended over to the palatal aspect of the tooth. This helps in providing a positive seat for luting and also a more aggressive tooth preparation. The preparation depth should be 0.4 mm near the

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gingival margin, rising to 0.7 mm for the bulk of the preparation. This is best achieved by using a depth cutting bur diamond depth cutter LSV-1 and LSV-2. [6] The preparation margins are then blended with a flat end round bur.

Porcelain veneers have been a popular treatment means to conservatively restore unaesthetic anterior teeth with favorable clinical performance. A number of clinical studies have confirmed the success of these veneers. Della Bona and Kelly did a comparative study on all-ceramic restorations. They reported that ceramics are well suited for veneer, and have a failure rate (including fracture or loss of retention) of less than 5% at 5 years. Other authors have concluded feldspathic porcelains show similar long-term survival rates: 96% in 5 years, 93% in 10 years and 91% in 12 years. Feldspathic veneers have undergone significant evolution and are created by layering glass-based (silicon dioxide) powder and liquid materials. Glass ceramics are ideally suited for use as dental restorative materials. Their mechanical and physical properties have improved, including an increased fracture resistance, improved thermal shock resistance, and resistance to erosion. They may be translucent or opaque, depending on the chemical composition and the percentage of crystallinity. The ceramics reinforced with lithium disilicate are true glass ceramics, with the crystal content increased up to approximately 70% and the crystal size refined to improve flexural strength. Feldspathic porcelain materials are generally indicated for anterior teeth when significant enamel is remaining. When deciding whether to use feldspathic veneers, it is necessary to undertake a flexural risk assessment.

For improvement of the esthetic appearance of anterior teeth, laminate veneer restoration is the treatment of choice. Correct diagnosis and precise treatment planning is very crucial to make laminate veneers as the preferred choice of treatment. [7,8] Veneering is quite a minimally invasive technique wherein the dentist applies biomimetic materials to provide a balance of ceramic and enamel. Restorations usually violate the balance between enamel and dentin in a natural teeth. Unlike these procedures, the use of porcelain laminate veneers provides an improved combination of resilience, resistance and hardness. Magne and Belser [9] concluded that if a tooth that is restored with a porcelain laminate veneer and has been subjected to posterior-anterior force; recovers to 89- 96% of its coronal stiffness, as compared to a healthy tooth. The diagnostic wax up becomes necessary to determine the final anatomy and position of the veneers. Porcelain veneers have been proposed as being durable anterior restorations with superior esthetics. New concepts in esthetic dentistry that are emerging with regards to materials technology and public awareness have proven veneers to be a demanding choice. [10]

Conclusion:

The long-term success of veneers depends on the vigilant skills of the dentist as well as the laboratory technician. Case selection, patient motivation and compliance are of utmost importance. An accurate and appropriate tooth preparation followed by pertinent adhesive bonding procedures result in a favorable aesthetic outcome.

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Figures

Figure 1 Pre-operative View

Figure 2 Ceramic veneers

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Figure 3 Try-in of ceramic veneers from 13 – 23

Figure 4 One-week post- operative view

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