

# Restoration of Anterior Teeth with Laminate Veneers by Digital Workflow: A Case Report

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**Abstract:-** From an aesthetic perspective, a person's teeth and smile has a great influence on their whole appearance and self-confidence. If the right method is used, ceramic veneers are thought to be the most durable and conservative alternative among all the other available treatment options. A detailed process for a young patient's anterior teeth rehabilitation using a fully digital workflow is described in this case report.

**Keywords:-** Zirconia Veeners, Aesthetic, Indirect Veneers, Cosmetic, Ceramic.

## I. INTRODUCTION

Aesthetic (cosmetic) dentistry is the art and science of dentistry used to create or improve a person's beauty while staying within the bounds of their physiology and function. Ceramic veneers are very thin bonded ceramic restoration shields that are applied to the labial surface, incisal surface and a portion of the proximal surface of the teeth. They provide a durable solution for improving the look of teeth that are broken, chipped, damaged, or unsightly. Ceramic veneers are conservative treatment option for correcting tooth fractures, malformations, and misalignments.<sup>[1]</sup> Reviews have confirmed that veneers have a clinically acceptable lifespan, and several clinical investigations have demonstrated effective treatments<sup>[2-4]</sup>. The preparation of the teeth is one of the key components of this method. Enamel, not dentin, provides the greatest or strongest connection when it comes to attaching ceramic to tooth structure. Veneers replaces the top layer of enamel and correct cosmetic defects.<sup>[5-7]</sup>

This case report describes the transformation of a smile carried out with a completely digital to provide a high level of aesthetic appeal while maintaining the preparation simple and reliable.

## II. CASE REPORT

The primary complaint of a 32 years old male patient who came to the Department of Prosthodontics was associated with spacing of upper front teeth (Figure 1, 2). Clinical examination revealed widespread diastema in the maxillary anterior region. Various treatment options were discussed with the patient. The use of ceramic veneers was recommended on the basis of patient's need and current condition.

However, since ceramic veneers are an aesthetic procedure, there was a detailed discussion with the patient based on the benefits, risks and procedure involved.

## III. TREATMENT PLANNED

Complete oral prophylaxis was done followed by diagnostic cast preparation. Diagnostic impressions were made. Face bow record was transferred and mounted in the semi adjustable articulator (Figure 3). The diagnostic wax-up was done (Figure 3) and a mockup was conducted with a silicone index impression. It was appropriate to assess the dynamic occlusion and aesthetics of the patient on the semi adjustable articulator. The phonetics and speech of the patient were evaluated. Prior to the preparation the shade selection was done by Vita Classic selection. Zirconia veneers were chosen due its its high flexural strength and the patient having edge to edge bite. Teeth 11, 12, 21, 22 underwent incisal wraparound style of tooth preparation (Figure 5). Incisal wrap around preparation offers the finest support for restoration and disperses occlusal stresses across a greater surface area. Furthermore, reducing the incisal edge leads to improved incisal translucency. Using a depth cutting bur, a labial reduction of around 0.3 mm was accomplished and a 0.5mm chamfer finish line was prepared , with rounded line angles.

Gingival retraction was accomplished using a 2-0 retraction cord. Using putty and a light body, a two-step imprint was created using polyvinyl siloxane impression material (Figure 5). Die stone was used to pour the imprint. (Figure 6). A CAD digital impression of the prepared maxillary teeth and a CAD digital scan of the mandibular teeth were taken(Figure 7,8). Protemp crown temporary material (Protemp 4) was used for the temporization (Figure 4).The prepared tooth surfaces were scanned intraorally through DENTSPLY SIRONA software (Figure 7-8). The purpose of the bisque trial was to assess the accuracy and marginal fit.

The trial of the veneers were done with the use of glycerine in patient's mouth and with the patient's satisfaction and consent further cementation was carried out.

### ➤ Preparation of Veneers for Bonding:

- The restoration were cleaned properly with acetone
- The veneers were etched with 4% Hydro Fluoric acid for 10 seconds & rinsed with water and air dried. (Figure 9).

- A silane coupling agent was applied for 15 seconds and dried with a stream of air
- The veneers were left in lightproof box till ready for bonding.

➤ *Preparation of Teeth for Bonding and Cementation:*

- After cleaning the tooth surface, 37% phosphoric acid was used for etching for 10 seconds and rinsed with water and air dried (Figure10).
- The bonding agent was applied, and it was light cured for 15 seconds(Figure11).
- For cementation, a dual cure resin luting agent (RelyX Universal Resin Cement) was utilised.
- The veneer was put on top of the prepared surface with slow, light pressure to allow excess material to release and avoid air bubbles and veneer lifting.
- The first five seconds were spent spot curing the veneers.
- Complete curing took place for 30 seconds after excess cement was removed using an explorer.
- Thus, final cementation of all veneers was completed (Figure 12).

The patient expressed great satisfaction with the result (Figure13).

**IV. DISCUSSION**

The choice of patient is a critical factor in veneer success where the ceramic veneers were selected as a minimally invasive care. With a normal overjet and overbite, a decent smile line, no parafunctional habits and enough enamel, veneers were the suggested course for treatment.

The restorations that are physiologically acceptable, were chosen due to their reduced cytotoxicity, increased chemical stability, and less risk of producing irritation or sensitivity. These restorations exhibit reduced plaque build-up and facilitate removal due to their evenly glazed surface [8-10].

Even before bonding, the veneers can be shattered because of their 0.3-0.5mm ceramic thickness, nevertheless, they became stronger and more resilient as soon as they are attached to the etched enamel surface blending in with the tooth texture. [8, 9]

Zirconia due to its good flexural and bond strength was used in the veneer preparation.



(a) (b) (c)  
Fig 1: Pre-Treatment Intraoral View (a) Frontal View (b) Left Lateral (c) Right Lateral



(a) (b)  
Fig 2: Pre-Treatment Intraoral View (a) Upper Occlusal (b) Lower Occlusal View

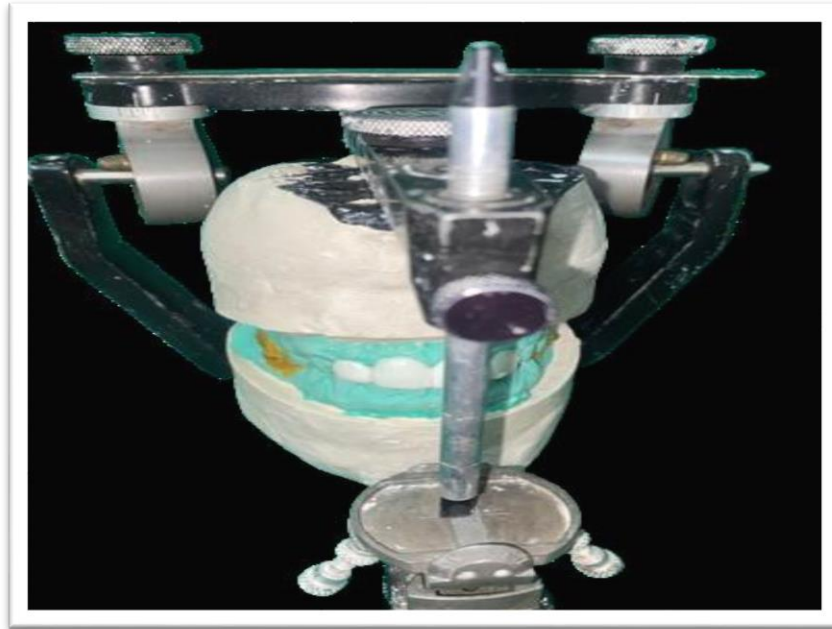


Fig 3: Mock up in semi adjustable articulator



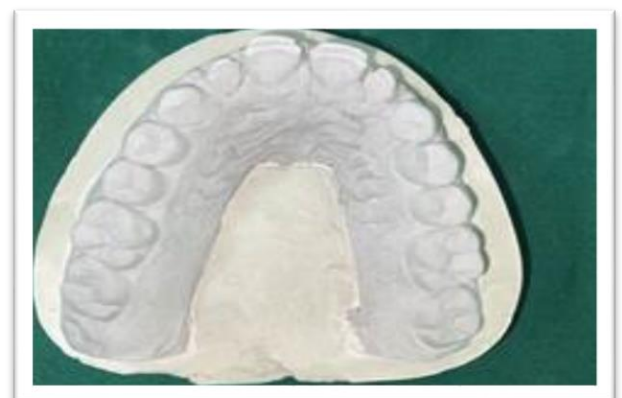
Fig 4: Temporization using Bisacrylate



Fig 5: Prepared Upper Teeth with Cord Placed



(a)



(b)

Fig 6: Bisque Trial for Cast (a) Upper Cast & (b) Lower Cast





Fig 7: Digital Smile Designing with Intra Oral Scan by (CEREC SW 4.2 SIRONA DENTAL SYSTEM)

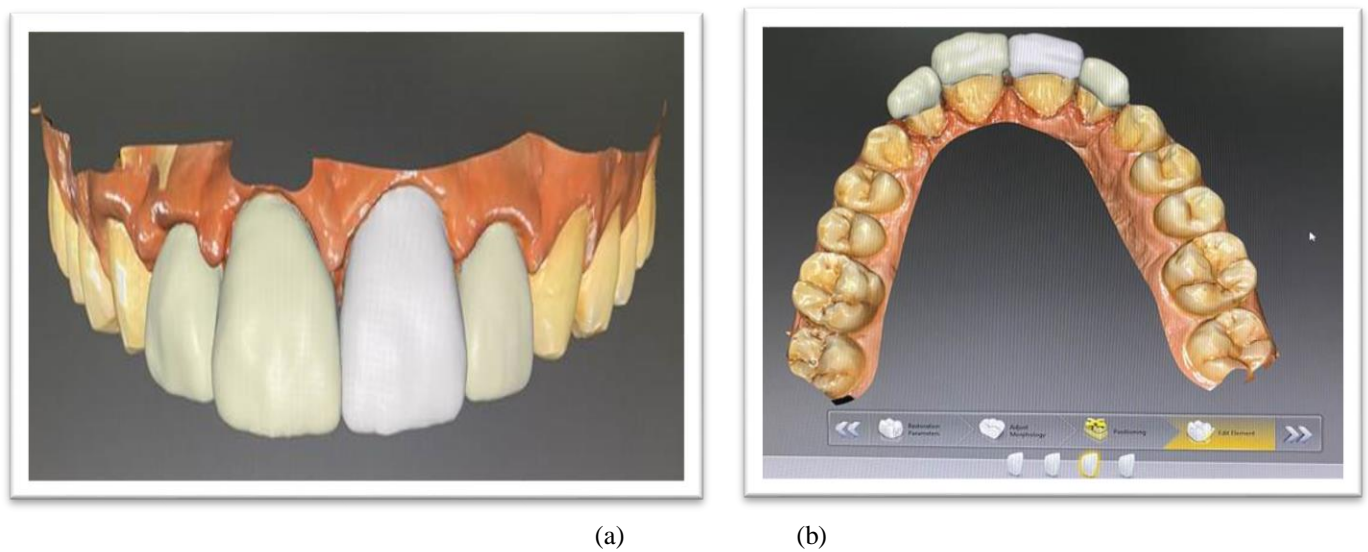


Fig 8: Digital Designing of Maxillary Veneers (a) Labial View (b) Lingual View

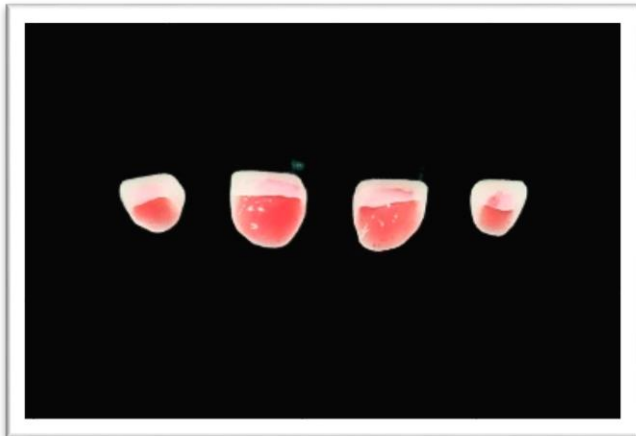


Fig 9: Surface Treatment of Veneers by 4.5% Hydrofluoric Acid



Fig 11: Surface Treatment of Tooth by DBA (Dentin Bonding Agent)



Fig 10: Surface Treatment of Tooth by 37% Phosphoric Acid



Fig 12: Final Cementation of Veneers (a) Labial View (b) Lingual View



(a)



(b)

Fig 13: Extra oral Preop (a) and Post op (b) Pictures of the Patient

## V. CONCLUSION

Veneers should not be treated like a "one size fits all" philosophy. When formulating a treatment plan, physicians need to consider every possible cosmetic option for the patient. A thorough clinical examination that includes an aesthetic evaluation is essential for a positive feedback.

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