



International Journal of Applied Dental Sciences

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2015; 1(4): 98-100
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www.oraljournal.com
Received: 18-07-2015
Accepted: 19-08-2015

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Esthetic rehabilitation by porcelain laminates - A case report

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Abstract

Porcelain laminate veneers are one of the most conservative and esthetic restoration that can be used for enhancing esthetics. As dentists, it is required of us to develop the skill sets for providing esthetically pleasing results without compromising the biological and functional principles of natural dentition. The use of porcelain laminates veneers to solve aesthetic and/or functional problems has been shown to be a valid management option especially in the anterior aesthetic zone. The current porcelain veneers are esthetically superior, conservative and durable treatment modality. Present Case report discusses a patient having discolouration of the teeth in maxillary arch in the anterior region and treated for problem. The patient was very satisfied with the result and had no complaints during 1 years of follow-up.

Keywords: Esthetics, Laminates, Conservative preparation, Porcelain

1. Introduction

Extremely minimal preparation with enamel preservation offer best results in esthetic dentistry. In the aesthetic dentistry, the porcelain veneers present the first class clinical conservative modalities. The concept of no preparation or minimal-preparation^[1] has followed the development of appropriate enamel bonding procedures. The colour and integrity of dental tissue substrates to which veneers will be bonded are important for clinical success^[2] using additional veneers with a thickness between 0.3mm and 0.5mm, 95% to 100% of enamel volume remains after preparation and no dentin is exposed^[3] A number of clinical studies have concluded that bonded laminate veneer restorations delivered good results over a period of 10 years and more^[4,5].

As being less invasive, for both hard and soft tissues and granting satisfactory aesthetic outcome, the rehabilitation procedure with porcelain veneers has been widely welcomed by the patients. In addition, the modern improvement of composite cements, adhesive systems and simplified cementation procedures also enable the promotion of this effective treatment approach among the dentists^[6,7].

Porcelain veneers is a thin bonded ceramic restoration that restores the facial surface and part of the proximal surfaces of teeth requiring esthetic restoration. The present case report describes the treatment of discoloured teeth in the anterior dentition with thin porcelain laminate veneers, to restore esthetics and function.

2. Case Report

A 32 year old female patient reported to the Department of Prosthodontics, Faculty of dental sciences, IMS, BHU, Varanasi with a chief complaint of discoloured anterior teeth as well as large size of front teeth and wanted esthetic rehabilitation for the same. The patient was unhappy with the appearance of her teeth and restrained herself from smiling due to self consciousness. A detailed family history, medical history and dental history was obtained. In family history, none of his family members had similar problem. Medical history was also not relevant. The blood investigations done were in normal limits. Past dental history revealed that, Patient had amalgam fillings.

Extra oral examination could elicit no abnormal findings. Intraoral examination revealed no significant finding except amalgam filling in 16, 17, 27, 36, 37, 46, and 47. The maxillary anterior exhibited variable degrees of pitting with yellowish to brownish discoloration of the surface (Figure.1). White opaque spots on the surface of enamel of maxillary incisors were also

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noted (Figure 2a, 2b). All teeth were vital and had no hypersensitivity. No carious teeth were present. Generalized gingival inflammation was noted and on probing mild bleeding was found. Moderate amount of calculus was present. Treatment for oral hygiene improvement was done.



Fig 1: Preoperative



Fig 2a: Intra oral - Buccal view



Fig 2b: Intra oral -Palatal view

Various treatment options were discussed which included laminate veneers, bleaching, composite veneering and micro abrasion. Owing to its minimally invasive nature and excellent aesthetic qualities it was decided to enhance her appearance using porcelain laminate veneers. Porcelain Laminates veneer for anterior maxillary segment from canine to canine teeth was planned.

Maxillary and mandibular diagnostic casts were made. After analyzing the patient's smile line it was decided to place porcelain laminate veneers from canine to canine in maxillary arches. Diagnostic wax up was done. Depth orientation grooves were placed on the facial surface of the tooth with 0.3mm and 0.5mm three wheel diamond depth cutter on the gingival half and incisal half respectively.

The tooth structure remaining between the depth orientation grooves were removed with a round end tapered diamond. Doing so, the a prismatic top surface of mature unprepared enamel, which is known to offer only a minor retention capacity, was removed. A chamfer finish line was placed lightly subgingivally in the maxillary anterior teeth. Distally the tooth preparation was extended into the contact area but terminated facial to the contact area. An overlapped incisal

edge preparation was chosen because incisal overlap provides a vertical stop that aids in the proper seating of the veneer. The lingual finish line was placed with a round end tapered diamond, approximately one fourth the way down the lingual surface connecting the two proximal finish lines. The finish line should be minimum 1mm away from centric contacts. The veneer extended onto the lingual surface will enhance mechanical retention and increase the surface area for bonding. All sharp angles of the preparation were rounded off. A coat of dentin bonding agent (Adper single bond 3M ESPE USA) was applied to the prepared teeth surfaces immediately after preparation (Figure.3).



Fig 3: Teeth Preparation Prepared for Impression

After gingival retraction, impression was made with polyvinylsiloxane by putty-wash technique using light cured customized impression tray (Figure.4). The shade was selected under direct sunlight with VITA 3D master shade guide. Temporary restoration was done with light cured composite resin. It was bonded to the teeth only at 2 to 3 spots with composite resin.



Fig 4: Final Impression

3. Veneer cementation

The temporary veneers were removed; the teeth were cleaned using pumice and were dried. The porcelain veneer made up of IPS-emax was tried on to the tooth with selected shade of try in paste to verify its color and fit. The esthetics and fit were acceptable, the veneers were removed from the tooth, rinsed thoroughly, and dried. The inner side of porcelain veneer was etched with 5% hydrofluoric acid (IPS Ceramic etching gel) for 20 seconds, washed under running water and dried. A layer of silane coupling agent (Monobond-S, Ivoclar vivadent) was applied on the inner surface of veneer and gently air dried after one minute. The silane coupling agent forms a chemical bond

between the porcelain and resin, besides it also reduces the marginal leakage and discolouration. The silanized surface was then coated with a thin layer of bonding agent thinned with air from the air syringe. The resin layer was polymerized with light. The prepared teeth were etched with 37% phosphoric acid for 30 seconds, rinsed thoroughly and dried. A layer of bonding agent (Adper single bond 3M ESPE USA) was applied on to the tooth surface. A dual cure resin cement (Variolink II, Ivoclar vivadent, Liechtenstein) was used for bonding the veneer to the tooth. The selected shade of base paste and catalyst paste were mixed in proportion to get the shade that was obtained during the try in stage, and a layer of cement was applied on the inner surface of veneers. The veneers were then positioned on the teeth correctly with slight pressure; the excess cement was removed with a brush (Figure. 5a, 5b). A coat of glycerine gel (Liquid strip- Ivoclar Vivadent) was applied along the veneer margins. Light curing of the luting composite was done through the Liquid strip for 10 seconds and the veneers were tacked to the teeth. After the initial set the remaining excess cement was removed with a NO: 12 Bard-Parker blade. The polymerization was continued for 60 seconds by directing the light initially from lingual side, so that the resin cement shrinks towards tooth providing more retention. Then each segment of veneer was light cured for 40 seconds. Occlusion was checked to ensure that no contact existed on tooth-porcelain interfaces. The patient was satisfied with her new emergence and smile.



Fig 5a: Check for Group Function in Protrusion



Fig 5b: Final Laminates Prosthesis

4. Discussion

The introduction of new dental technology combined with changing patients attitude, is slowly altering dentistry's approach to esthetic problems. 8, 9 The patients acceptance of the porcelain laminate veneer technique now-a-days seems to be high. A study conducted by Goldstein and Lancaster ^[10] showed that patients would readily accept shorter restoration life expectancy (five to eight years) if enamel could be saved by not reducing the tooth for a full crown. The technique is expected in the near future to be drastically simplified. A clinical research to date has shown excellent retention rates. The introduction of high strength dentin bonding agents and

reliable resin cements will accelerate the progression towards bonded porcelain used in clinical practice ^[11].

On the other hand long-term study of porcelain veneers is required in order to study their marginal integrity, marginal staining and their effect on gingival tissues (ideally) 0.3 mm of thickness for each shade change. Based on literature it appears that if the veneer precision. This ensures minimal damage to tooth and gingiva and ensure optimal long-term prognosis. Despite following all precautions, because of the delicate nature of porcelain veneers, a possible post-operative complication is cracking. If the veneer has been well bonded to the underlying enamel and is not an aesthetic concern, the patient should be informed and the veneer should be left in place ^[12].

5. Conclusion

Porcelain veneers are useful adjuncts to dentists' armamentaria; they help in the management of esthetic problems, minimizing dental tissue reduction. The veneers are technique and material sensitive but if used with proper knowledge and skill, these restorations provide the best esthetic and functional outcome. The predictability of any restorative process will rest on the precise evaluation of oral and occlusal conditions.

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