

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service Available Online at: www.ijdsir.com

Volume – 2, Issue – 4, July – August - 2019, Page No. : 348 - 354

Aesthetic Enhancement by Porcelain Laminate Veeners: A Case Report

¹Dr Amar A. Thakare, Senior lecturer, MDS, Prosthodontics

Dr Vishakha W. Ugale, Senior lecturer, MDS, Prosthodontics

³Dr Manisha M. Kulkarni, Reader, MDS, Prosthodontics

⁴Dr Sonam Muthiyan, Reader, MDS, Endodontics

Department of Prosthodontics and Implantology; YCMM & RDF'S Dental College & Hospital, Ahmednagar,

Maharashtra, India.

Corresponding Author: Dr Vishakha W. Ugale, Senior lecturer, MDS, Prosthodontics, Department of Prosthodontics and Implantology; YCMM & RDF'S Dental College & Hospital, Ahmednagar, Maharashtra, India.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Porcelain laminate veneers have evolved over the last several decades to become one of the esthetic dentistry's most popular restorations. It is a conservative alternative to full coverage for improving the appearance of an anterior tooth. The development of new materials and techniques based on the principles of adhesive dentistry has improved the cosmetic aspect of dental restoration. 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 of the patient. The current porcelain veneers are esthetically superior, conservative and a durable treatment modality. This case report aimed to describe a esthetic rehabilitation with porcelain veneers of a patient unsatisfied of his smile. A 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.

Keywords: smile designing, porcelain laminate veneers, golden proportion conservative dentistry

Introduction

A smile reflects a person's inner self. A sparkling smile in harmony with the lips and face enhances the beauty of the individual character. Each smile is unique and special to that particular person. The dentists perception, talent, artistic flare and skills in listening to the particular desires of his patient, help to recreate a smile that suits the face and personality of each individual patient^[1].

Recent technology in the field of cosmetic and aesthetic dentistry had provided with new opportunities in conservative and aesthetic restorative procedures. There are various methods to treat cosmetic dental problems depending upon the problem per se. Diastema, tooth size discrepancy, discolorations, staining, fractures in teeth, endodontic treatment, and smile designing are some of the reasons for which patient requires aesthetic treatment^[2]. The concept of no preparation or minimal-preparation of tooth has followed the evolution of appropriate enamel bonding procedures. As being minimum invasive method, for both hard and soft tissues and ensuring satisfactory

Corresponding Author: Dr Vishakha W. Ugale, ijdsir Volume 2 Issue 4, Page No. 348 - 354

result, the rehabilitation procedure using porcelain veneers has been widely welcomed by the individuals^[3].

In addition, the recent improvement of composite, different adhesive systems and simplified cementation procedures also helps in the promotion of this effective treatment approach among the various dentists. Porcelain veneers is a thin bonded ceramic restoration that restores the facial and proximal surfaces of teeth requiring esthetic restoration and correction. The present case report describes the treatment of fractured teeth and mid-line diastema in the anterior dentition with thin porcelain laminate veneers, to restore esthetics and function^[3].

Case Report

A thirty five years old male patient reported to the department of prosthodontics crown & brigde and implantology for esthetic improvement of his teeth. Past dental history revealed the history of trauma to both the maxillary central incisors since 2yrs back. Intraoral examination revealed Ellis class I fracture with both the maxillary central incisiors, chipped off and discoloured composite restoration.

A mid-line distema was also present between both the maxillary central incisiors (Fig-1,2). All teeth were vital and had no hypersensitivity. A radiograph was taken and revealed no abnormal findings. Considering to its minimally invasive nature and excellent aesthetic qualities it was decided to enhance his appearance using porcelain laminate veneers.



Fig1 1: Preoperative view



Pre-prosthetic phase: Removing all old composite restorations, followed by scaling and polishing.

Prosthetic phase: Impressions were made for diagnostic wax-up in order for the patient and the dentist to know the final outcome of the treatment and preparation for laminates.

Procedure: After the pre-prosthetic phase, diagnostic impressions were made in irreversible hydrocolloid material. The facebow record is made & the orientation jaw relation was transferred to the semi adjustable articulator (HANAU). The cast were studied and a diagnostic wax up was carried out (Figure-2).





Fig. 2: Orientation relation and diagnostic mounting The golden proportion was determined using the golden proportion gauge. The wax-up was shown to the patient and the patient accepted and satisfied to the prescribed option. Before carrying out the tooth preparation for laminates Shade selection was carried out using Vitapan Classical shade guide (VitaZahnfabrik, Germany).(Fig-3,4)





Fig. 3: Measurement with golden proportion gauge





Fig. 4 : Diagnostic wax up

Mock trial was done in patient mouth by fabricating a putty index of wax up. Patient approval was taken regarding the esthetics and further treatment was proceeded. Gingivoplasty was done to correct the gingival zenith position on right side.(Fig- 5,6&7)



Fig: 5-Putty Index



Fig: 6- Temporary Trial





Fig. 7 : Gingivoplasty for esthetic contouring

The 6 maxillary anterior teeth were then prepared to receive porcelain laminate veneers. Depth orientation grooves were placed on the labial 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. A chamfer finish line was placed lightly sub-gingivally in the maxillary anterior teeth. Distally the tooth preparation was extended into the contact area but terminated facial to the contact area.

The length of the maxillary central incisors was adjusted according to the aesthetic plane. Mesial reduction was kept at a minimum in the maxillary right lateral incisor and more of reduction on the distal side was done in order to compensate for the diastema.

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 checked and rounded off (fig- 8,9).



Fig. 8: Composite Build up



Fig. 9: Tooth Preparation

A coat of enamel bonding agent (single bond 3M ESPE) was applied to the prepared teeth surfaces immediately after preparation. After gingival retraction, (Fig-10)

impression was made with poly-vinyl siloxane by puttywash technique using light body impression material. (Fig-11).



Fig. 10: Gingival retraction & Isolation



Fig. 11: Final Impression

The shade was selected with VITA 3D master shade guide. Temporary restoration was done with Pro-Temp (provisional restorative material) using spot etching technique.(Fig 12).



Fig. 12: Temporization with spot etching technique



Fig.13: Post Temporization

Veneer cementation

The temporary veneers were removed; all teeth were cleaned and dried. The porcelain veneer made up of IPS-E max 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 10 seconds, washed under baking soda and dried. (Fig-14)





Fig. 14: Application of silane coupling agent

A consecutive 3-4 layers of silane coupling agent (Monoborid-S, Ivoclar vivadent) was applied on the inner surface of veneer and gently air dried at a interval of one minute. The silane coupling agent forms a M-R-X bond between the porcelain and resin, besides it also reduces the marginal leakage and discolouration.





Fig: 15 - Etching veneer with hydrofluoric acid The prepared teeth were etched with 37% phosphoric acid for 30 seconds, rinsed thoroughly and dried. (Fig-16) A layer of bonding agent (Adper single bond 3M ESPE USA) was applied on to the tooth surface. A dual cure

resin cement (3M) was used for bonding the veneer to the tooth.(Fig-17).



Fig .16: Etching of prepared tooth



Fig. 17: Application of bonding agent

The veneers were then positioned on the teeth correctly with gentle pressure, the excess cement was removed with a brush. A coat of glycerine gel (Liquid strip- Ivoclar Vivadent) was applied along the veneer margins. (Fig-18,19) Light curing of the luting composite was done through the Liquid strip for 5 seconds and the veneers were tacked to the teeth.



Fig. 18 & 19: Veener applied with luting composite After the initial set the remaining excess cement on teeth were removed with a NO: 12 Bard-Parker blades along with the retraction cord which also helps to remove the excess cement (Fig- 20). The polymerization was continued for around 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 premature contact existed on tooth-porcelain interfaces. The patient was satisfied with his new smile (Fig – 21)



Fig. 20: Application of composite luting agent, intial curing and excess removal





Fig. 21: Post cementation **Discussion**

Tooth preparation - concepts regarding the conservative preparation of teeth for porcelain veneers have changed over a past few years in dentistry. Early concepts suggested that minimal or no tooth preparation, but current trend support removal of certain amount of tooth structure while preparation. To enhance aesthetics in anterior teeth by means of laminate veneers, basically two types of materials are frequently used for their translucency and potential to be used in small thickness: sintered feldspathic porcelain and pressable ceramic, which can be also, be used milled using a computer-aided manufacturing technique (CAD/CAM)^[1].

Four basic incisal preparations exist for full veneers: (a) The 'window' or intra-enamel preparation- Preparation terminates 1mm above the incisal edge

(b) The feathered incisal edge preparation -Preparation terminates at the facioincisal line angle

(c) The incisal bevel preparation-a buccopalatal bevel is placed at the incisal edge of the tooth

(d) The Overlapped incisal edge preparation-Veneer overlaps the incisal edge terminating on the lingual surface^[4].

Dentist should prefer their choice of material on the requirements of the particular tooth being restored, such as the indication and the necessary of the tooth preparation to enhance aesthetics and improve function. Glass ceramics may be ideal choice for uses as dental restorative materials. The mechanical and physical properties of glass ceramics have generally improved, including increased fracture resistance, improved thermal shock resistance, and resistance to erosion^[4].

The clinical success of indirect ceramic bonded restorations and direct ceramic repair procedures depend on effective etching of the ceramic surface. The main purpose of surface modification of the porcelain is to increase the surface area available for bonding and to create undercuts that will help to increase the strength of the bond to the resin luting cement^[1].

The introduction of new dental technology and equipments combined with changing patients attitude and demands, is slowly altering dentistry's approach to esthetic problems. The patients acceptance of this type of conservative techniques now-a-days seems to be high^[5,6]. The main advantages of porcelain laminate veneers are aesthetics, biocompatibility, effective colour change, inherent strength and its resistance to fluid absorption. The disadvantages of porcelain laminate veneers include

difficulty in colour matching, liability to fracture, sensitive bonding procedures, lack of repair and high cost factor^[1]. Aesthetic rehabilitation of the maxillary anterior teeth of a young adult was successfully done with the help of laminate veneers made of ceramic reinforced by lithium disilicate. The patient was educated and informed regarding the importance of maintenance of oral hygiene and was advised for periodic follow up.

Conclusion

The veneers are very technique and material sensitive but if used with proper knowledge and skill, these restorations offer the best aesthetic and functional outcome. The predictability of any restorative treatment will depend on the precise evaluation of oral health, occlusal conditions and patients requirement. Bonded porcelain veneers can provide successful aesthetic and functional long-term service for patients with diastema. Bonded porcelain veneers have a number of significant advantages over metal-ceramic or all-ceramic crowns. One of the most important advantages is that they are extremely conservative in terms of tooth structure reduction.

References

- Dr. Biji Kurien et al: Enhancing Smile with Laminate Veneers – A Case Report; IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)Volume 14, Issue 5 Ver. II (May. 2015), PP 49-53
- Rubina Tabassum :Porcelain Laminate Veneers An Esthetic Bond: A Case Report; J Cont Med A Dent May-August 2014 Volume 2 Issue 2
- Romesh Soni, Rajul Vivek: Esthetic rehabilitation by porcelain laminates - A case report; International Journal of Applied Dental Sciences 2015; 1(4): 98-100

- Spear F. Holloway J. Which all-ceramic system is optimal for anterior for anterior esthetics? J Am Dent Assoc. 2008:Suppl 139: 19S-24S.
- 5. Academy of prosthodontics: The glossary of prosthodontic terms-8. J Prosthet Dent. 2005; 94:54.
- Gurel G. Predictable, precise, and repeatable tooth preparation for porcelain laminate veneers. Pract Proced Aesthet Dent. quiz 26 2003; 15(1):17-24.
- Dlugokinski MD, Frazier KB, Goldstein RE: Restorative treatment of Diastema. Esthetic in Dentistry (Vol.2).RE Goldstein, VB Hoywood (Eds.); 2nd Edn.; BC Decker Inc. London, 2002;pp703-732.
- Dumfahrt H, Schäffer H. Porcelain laminates veneers. A retrospective evaluation after 1 to 10 years of service: Part II-Clinical results. International Journal of Prosthodontics 2000;13(1):9-18.
- Horn HR: Porcelain laminate veneers bonded to etched enamel. Dental Clinics of North America 1983;27(4):671-684.
- Jordan RE, Suzuki M, Senda A. Clinical evaluation of porcelain laminate veneers: a four- year recall report. Journal of Aesthetic & Restorative Dentistry 1989;1(4):126-132.
- Radz GM. Minimum thickness anterior porcelain restorations. Dent Clin.North Am. 20II;55(2):353-370.
- Calamia JR, Calamia CS Porcelain laminate veneers: reasons for 25 years of success. Dent Clin N Am. 2007:51:399-417.
- Calamia JR, Calamia CS. Porcelain laminate veneers: reasons for 25 years of success. Dental Clin N America 2007; 51(2): 399-417.
- Magne P, Belser U. Bonded porcelain restorations in the anterior dentition: A Biomimetic Approach. Germany: Quintessence, 2003.

- 15. Y Katoh Y Taira C Kato M Suzuki K Shinkai A Case Report of a 20-year Clinical Follow-up of Porcelain Laminate Veneer Restorations: Operative Dentistry, 2009, 34-5, 626-630
- Rubina Tabassum Porcelain Laminate Veneers An Esthetic Bond: A Case Report: J Cont Med A Dent;2014 :Volume 2 Issue 2
- Dr. Biji Kurien, Dr. Gilsa K Vasunni, Dr.Mohamed Saheer Kuruniyan: Enhancing Smile with Laminate Veneers – A Case Report IOSR-JDMS 2015;Vol 14(5): 49-53
- Romesh Soni, Rajul Vivek; Esthetic rehabilitation by porcelain laminates - A case Report IJADS 2015; 1(4): 98-100
- Manuele Mancini and Maurizio Mancini Ceramic Veneers: A Step-by-Step Case Report Global Journal of Oral Science, 2016, 2, 20-27