`International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 5 Issue 6, June-2018, Impact Factor: 1.338

Dental laminate veneers – An Approach for Restoring Esthetics of Fluorosed Teeth: A Case Report

Avneet Dengre[1], Gaurav Kumar[2], Swati Garg[3], Ritu Namdev[4]

[1,3,4]Department of Pedodontics and Preventive Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, India
[2] Department of Conservative Dentistry and Endodontics, Post Graduate Institute of Dental Sciences, Rohtak, India

ABSTRACT

Veneers comprise as an efficient treatment option in the esthetic rehabilitation of anterior teeth. Porcelain laminate veneers serve as a conservative treatment modality in management of wide variety of cases such as correcting tooth discolorations, diastema, coronal fracture, tooth defects or adjustment of occlusion. This case report describes the esthetic rehabilitation of discolored maxillary anterior teeth with laminates. Such a prosthetic technique leads to reproduction of esthetic and lifelike appearance of natural teeth with minimal loss of tooth structure.

Keywords: Veneers, Laminates, Porcelain, Esthetics.

INTRODUCTION

Concern regarding restoration of aesthetic appearance of anterior teeth is steadily growing among teenagers and adolescents. Ceramic veneers have gained wide acceptance in esthetic dentistry since their introduction in the early 1980s.[1] Earlier, the most predictable and durable treatment option was full coverage crown. However, this invasive approach led to removal of substantial amount of sound tooth structure and possible adverse effect on pulp and periodontium. Following the introduction of bonding by Buonocore in 1955[2], composite resin led to the development of a conservative approach towards esthetic restoration of such teeth. However, composite veneers are susceptible to discoloration and wear and serve as short to medium term restorations.[3] Later Horn and Simonsen and Calamia introduced special acid etching techniques for porcelain veneers which improved their retention.[4,5] Since then, porcelain veneers have become an integral part of esthetic dentistry.

Porcelain is a highly esthetic material with high resistance to stain and abrasion. Glazed porcelain has a longstanding history as a nonporous and biocompatible material and hence, it minimizes plaque adherence and promotes gingival health in well maintained mouths. Laminates allow clinicians to restore function and esthetics in a conservative and biologically sound manner.

This article discusses a case report addressing both the functional and esthetic requirements to restore discolored anterior tooth through a minimally invasive technique.

CASE REPORT

A 16-year old female patient reported with the chief complaint of discolored upper front teeth and unaesthetic smile. On intraoral examination, white and brown fluorosis stains were observed in all the teeth with severe discoloration and pitting on maxillary central incisors [Figure 1]. Patient had no sensitivity to hot and cold. She was not comfortable in smiling due to the presence of discoloration. Pulp test suggested of pulpal death in relation to 21. After careful examination, it was decided to perform root canal treatment in tooth 21 followed by all ceramic laminates for both 11 and 21. The patient's parents were informed about the treatment plan, its advantage and shortcomings, other treatment alternatives and consequences if treatment was avoided.

The treatment goal was to eradicate dead pulp and restore function and esthetics by minimally invasive approach which can serve for a long term. The treatment plan was divided into following 2 steps:

Step 1: Tooth preparation

Treatment was initiated with root canal treatment of tooth 21 followed by composite restoration of the access cavity. It was then followed by laminates. Before the commencement of tooth preparation for veneers, oral prophylaxis was done. Maxillary and mandibular diagnostic casts were made. The colour of ceramic veneers was selected and incisal guidance was checked. Putty index was made to guide the amount of tooth structure removal. Depth orientation grooves were placed on the facial surface of the tooth 11 and 21 with 0.3mm and 0.5mm three-wheel diamond depth cutter on the gingival half and incisal half respectively [Figure 2]. The remaining tooth structure between the grooves was removed with a round end tapered diamond. Doing so, removal of aprismatic top surface of mature unprepared enamel, which is known to offer only a minor retention capacity, was done. A chamfer finish line was prepared lightly subgingivally. Proximally, tooth preparation was extended into the contact area but terminated facial to the contact area [Figure 3(A)]. An overlapped incisal edge preparation was chosen because of the abraded incisal edge [Figure 3(B)].. Also, incisal overlap provides a vertical stop to aid in proper seating of the veneer. Lingual extension enhances mechanical retention and increase the surface area for bonding. Tooth reduction was checked by putty index [Figure 4(A, B)]. All sharp angles of the preparation were rounded off. After gingival retraction, impression was made with polyvinyl siloxane by putty-wash technique. Temporary restoration was done with light cured composite resin.

Step 2: Veneer cementation

The temporary veneers were removed. Teeth were cleaned using pumice and were dried. The porcelain veneers made up of IPS-emax were tried on to the teeth 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 9% hydrofluoric acid (Ultradent Porcelain Etch, US) for 90 seconds, washed under running water and dried. A layer of silane coupling agent (Silano, Angelus, Brazil) was applied on the inner surface of veneer and gently air dried after one minute. 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 (Coltene, Switzerland) was applied on to the tooth surface. Dual cure resin cement (Solocem, Coltene Whaledent, Switzerland) was used for bonding the veneer to the tooth. A layer of cement was applied on the inner surface of veneers. The veneers were then positioned on the teeth correctly with slight pressure and the excess cement was removed with a brush.

Light curing of the luting composite was done for 10 seconds and the veneers were tacked to the teeth. After the initial set the remaining excess cement was removed. 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 [Figure 5]. Occlusion was checked to ensure that no contact existed on tooth-porcelain interfaces. Patient was given post operative instructions and recalled for follow ups.

Fig. 1: Pre-operative

Fig. 2: Depth orientation grooves

Fig. 3(A): Tooth preparation

Fig. 3(B): Incisal overlap preparation

Fig. 4(A): Putty index incisal reduction Verification

Fig. 4(B): Labial reduction verification

Fig. 5: Veneer cementation

DISCUSSION

Tooth veneering is a minimally invasive technique that enables the clinician to follow biomimetic principles in esthetic dentistry. A wide variety of restorative procedures violate the balance between dentin and enamel in natural dentition. Veneering serves to find a balance between enamel and ceramic.[6] Laminates have undergone much evolution and can be used as direct veneers like composite resin veneers or indirect veneers like laboratory fabricated acrylic resin, micro fill resin, preformed laminates and porcelain veneers.

Resin veneers offer concern regarding discoloration and wear and hence, have been recommended for minor cases and short to medium term restorations. Porcelain veneers have however, evolved as an esthetic and minimally invasive approach that tends to be more biocompatible and having high resistance to abrasion.[7] The use of ceramic veneers offers an excellent combination of hardness, resistance, and resilience. Also, the advancement in ceramic system offers a homogeneous interlocking structure that prevents internal crack propagation.[8] However; laminates often require a favourable environment which should be assessed prior to commencement of procedure. If this is unfavorable and margins will be on dentine or if excessive enamel needs to be removed, then alternative treatment options should be considered. It is important to strive for clinical and laboratory composite thickness ratio of above 3:1. When this ratio is large, the forces created by polymerization shrinkage of the luting cement may cause fracture of the thin ceramic veneer. Post bonding cracks are an acknowledged, rare, complication of ceramic veneers.[9, 10] Also, clinical factors such as substrate color, thickness of laminate and luting system potentially affect the final esthetic result. Thus, the clinical success of the technique depends on complete analysis and correct identification of a case for which this treatment is appropriate and the successful execution of the clinical steps involved.

CONCLUSION

Porcelain laminates serve as a milestone in cosmetic dentistry. It serves as a minimally invasive and extremely conservative technique which restores optimum esthetics when performed according to a well-designed treatment plan and a strict protocol during the clinical and laboratory stages.

CONFLICT OF INTERESTS

The author declares no conflict of interests.

REFERENCES

[1]. Peumans M, Van Meerbeek SI, Lambrecht P, Vancherle G. Porcelain veneers : a review of the literature. *J Dent*. 2000;28(3):163-77.
[2]. Nakabayashi N, Kojima K, Masuhara E. The promotion of adhesion by infiltration of monomers into tooth substrates. *J Biomed Mater Res*. 1982;16(3):265-73.
[3]. Peumans M, Van Meerbeek B, Lambrechts P, Vanherle G. The five-year clinical performance of direct composite additions to correct tooth form and position. Part I: aesthetic qualities. *Clin Oral Investig*. 1997;1(1):12-8.
[4]. Horn RH. Porcelain laminate veneers bonded to etched enamel. *Dental Clin N America*. 1983;27(4):671-84.
[5]. Simonsen RJ, Calamia JR. Tensile bond strength of etched porcelain. *J Dental Res*. 1983; 62: 297.
[6]. Mehta J, Shah N, Mahajan S, Desai P. Optimizing esthetics with ceramic veneers: a case report. *Journal of Dental and Medical Sciences*. 2017;16(4):75-9.
[7]. Mancini M, Mancini M. Ceramic veneers: a step-by-step case report. *Global Journal of Oral Science*. 2016;2(1):20-7.
[8]. Christensen GJ. Veneering of teeth: State of the art. *Dent Clin North Am*.1985;29(2):373-91.
[9]. Calamia JR. Etched porcelain veneers: the current state of the art. *Quintessence Int*. 1985;16(1):5-12.
[10]. Gurel G, Sesma N, Calamita MA, Coachman C, Morimoto S. Influence of enamel preservation on failure rates of porcelain laminate veneers. *Int J Periodontics Restorative Dent*. 2013;33(1):31-9.