

Esthetic Rehabilitation of Maxillary Anteriors Using Laminate Veneers - A Case Report¹Dr. M.V. Srikanth, Senior Lecturer, Department of Prosthodontics, Sathyabama Dental College and Hospital, Chennai²Ms. S. Sri Mahalakshmi, CRRI, Sathyabama Dental College and Hospital, Chennai³Dr. V. Balakumar, Professor, Department of Prosthodontics, Sathyabama Dental College and Hospital, Chennai⁴Dr. R. Durga, Senior Lecturer, Department of Orthodontics, Tagore Dental College and Hospital, Chennai**Corresponding Author:** Dr. M.V. Srikanth, Assistant Professor, Department of Prosthodontics, Sathyabama Dental College, Chennai, Tamil Nadu**Citation of this Article:** Dr. M. V. Srikanth, Ms. S. Sri Mahalakshmi, Dr. V. Balakumar, Dr. R. Durga, “Esthetic Rehabilitation of Maxillary Anteriors Using Laminate Veneers- A Case Report”, IJDSIR- August – 2024, Volume –7, Issue - 4, P. No. 259 – 264.**Copyright:** © 2024, Dr. M. V. Srikanth, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution non-commercial License. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given, and the new creations are licensed under the identical terms.**Type of Publication:** Case Report**Conflicts of Interest:** Nil**Abstract**

One of the most crucial aspects of an Aesthetic dentist is rehabilitating the teeth in the esthetic zone. The aim of rehabilitation in such cases is to conserve as much tooth structure as possible while restoring its aesthetics and function. There are various methods of esthetic restoration such as Full coverage restoration, Bleaching, Orthodontic correction, smile designing, and veneers. In this case report, the smile of a 25-year-old female with dental fluorosis in the maxillary anterior region is rehabilitated using a minimally invasive method of tooth preparation restored using 3D milled glass ceramic (Lithium Disilicate) veneers.

Keyword: Esthetic Zone, Veneers, Fluorosis, Lithium disilicate.**Introduction**

Smile is a person’s ability to express a range of emotions. The demand for a pleasant smile drives us to

the field of dental esthetics and thus the role of a prosthodontist becomes significant ^[1]. De-van's dictum states that the aim of a prosthodontist is not only the meticulous replacement of what is missing but also the perpetual preservation of what is present ^[2]. Defects in the anterior teeth that affect the aesthetic appearance of an individual may be the result of traumatic injuries, pulpal pathologies, dental caries, developmental disturbances, Internal discolorations, and opacities to name a few ^[3]. These types of defects might lead to a lack of self-confidence, and personality and may affect psychologically especially if the defect is in the esthetic zone. Dental fluorosis is caused by excessive fluoride intake during tooth formation. Fluorosis is characterized by the presence of opaque white areas presenting as horizontal lines and cloudy patches on the enamel surface in mild cases, brown stains, and pits on the enamel in moderate to severe cases. There are various

treatment options such as bleaching, full coverage crowns, orthodontic treatment, Smile designing, and Veneers [13]. Porcelain veneers are increasing the modern-day esthetic correction in the esthetic zone because it is one of the noninvasive and less time-consuming [4]. Veneers are a thin sheet of material usually used as a finish [5]. Veneers are a popular cosmetic Dentistry solution that can transform the appearance of a person's smile. Charles Pincus developed dental veneers in 1930^[6]. Initially, Charles Pincus attached an acrylic material to the front surface of teeth and held them in place temporarily using a special adhesive [7]; at that time veneers stayed in place for about an hour or two. In 1930-1940 the progression in dental veneers was slow. In 1983 Simonsen and Calamia demonstrated that the etching of the internal surface to the porcelain veneer allowed the veneer to be retained on the etched tooth surface better than the composite veneers [8,9]. This method of attaching a restoration to the tooth surface evolved as a cosmetic treatment option in the field of art and cinema. Dr. Pincus offered cosmetic dental treatment as many actors and actresses sought out whiter, brighter smiles for the cameras hence veneers are called Hollywood smiles. They are thin, custom-made, shells of tooth-colored material that are placed over the front surface of the teeth. Veneers are a versatile and effective solution for addressing various dental concerns such as discoloration, chipped or worn teeth, midline diastema, fluorosis, and nonvital teeth. Hence, they provide natural-looking and durable solutions to enhance the overall esthetics of a person's smile. Hence a noninvasive method of restoration can be chosen over the conventional restoration for better esthetic outcome. In this tooth preparation is confined to enamel rather than dentin which provides the best and strongest bond values when we want to bind the porcelain to the tooth

surface [10]. The main objective of tooth preparation is simple and conservative. As both the veneers and crowns work by adding a covering to an existing tooth to improve its appearance and function, the main difference lies in the amount of tooth structure removed and the material added to make it look much more natural. In this aspect, veneers provide a more natural and lifelike appearance as only a thin layer of tooth enamel from the front surface of the tooth is removed to place a veneer. Initially, Charles Pincus used porcelain veneers which are retained by a denture adhesive, later Simonsen and Calamia as well as Horn reactivated the interest in porcelain veneers by introducing special acid etching procedures that substantially improved the long-term porcelain and Veneers retention^[6]. The materials used for veneers have evolved significantly over the years by improving durability, aesthetic appeal, and longevity. Initially from acrylic veneers, resin veneers, composite veneers, ceramic veneers, lithium disilicate veneers, and zirconia veneers to the recent advancement of using CAD/CAM technology.

Case Presentation

A 25-year-old female presented with a complaint of an unattractive smile due to staining of the upper teeth since childhood. Radiographic and clinical examination did not reveal any periapical pathological condition. No systemic disease or relevant medical history was reported. The patient had undergone scaling and in house bleaching 2 years back which did not show any improvement in the stains of the teeth.

Treatment Planning

On detailed examination and investigation, the discoloration presented as opaque patches and subsurface brown stains was diagnosed as Dental fluorosis of moderate variety based on Dean's fluorosis index. (Dean's fluorosis index= grade 4)^[12]. Several

treatment options such as micro abrasion, and resin infiltration, combined with home and in-office bleaching, composite veneering, laminate veneers, and crowns with their pros and cons were explained to the patient^[13]. A minimally invasive procedure of Veneers for upper anterior teeth was chosen for long-term aesthetic results with minimal loss of tooth structure and complete masking of underlying fluorosis.

Preoperative Intra-oral photographs were taken (Fig-1, Fig-2), and diagnostic Impressions of upper and lower teeth were obtained. Patients' smiles, gingival biotype, and lip length were assessed to determine the type of veneer preparation. The patient had a thick gingival biotype, moderate smile line, and medium lip length. Based on the above findings, the incisal overlap design was chosen for better aesthetic outcomes and a high success rate.

On the second visit, tooth preparation was done for the anterior six teeth in the maxilla (Fig-3). The depth grooves were placed using the depth guide bur to an extent of 0.3mm on the gingival surface, 0.5mm on the labial surface, and 0.7mm on the incisal surface. A chamfer finish line was given subgingival with a round end tapered diamond. The proximal contacts were not broken to maintain the aesthetics as well as integrity. An incisal overlap of 1mm was prepared on the palatal surface with all the internal lines angled and rounded to reduce the stress concentration. The teeth were polished and smoothed and gingival retraction was carried out using 00 gingival retraction cord (Fig-4). Vitapan 3D master shade guide was used to select the shade under natural light. Digital impressions were made using a Medit I700 intraoral scanner and sent to the lab for design and fabrication (Fig - 5).

The material of choice for this particular case was Lithium Di silicate (Commercially known as E-max).

E-max veneers were preferred for their long-lasting aesthetic qualities, appealing translucent color, and natural life-like appearance. As there are studies stating that there is no effect of fluorosis and bonding of the restoration to teeth, Lithium disilicate is used following the cementation protocols^[17].

Cementation Procedure

On the third visit (after 24 hours) the cementation of the E-max veneers was carried out using standard protocols. All 6 laminates were tried for fit, gingival extension, shade matching, and alignment (Fig-6, Fig-7). The surface of the veneers was treated with 9% Hydrofluoric acid (Fig-8, Fig-9) for 20 seconds after which the acid was washed and dried. A silane coupling agent (SILANO) (Fig-10) was applied onto the acid-etched surface of the veneer. Prolonged etching of the tooth surface using 37% phosphoric acid (Eaze etch) for 30 seconds showed a significant increase in the bonding of restoration to the tooth surface in fluorosis cases^[14] and an adhesive agent (Ivoclar) was applied and lightly cured. 3M ESPE Rely-x veneer Resin cement (Fig-11) was applied on the surface of the veneer, and excess cement along the gingival margins was removed and cemented on the tooth surface and lightly polymerized. Post-operative photographs were taken (Fig-12, Fig-13).

Discussion

The success of any restorative procedure relies upon the case selection. The basic requirements for a veneer restoration are an adequate amount of enamel and dentin to provide proper bonding, parafunctional habits to prevent debonding and fracture, and good oral hygiene. There should be at least 50% enamel present to provide adequate bonding for the success of laminate veneers^[15,16]. As the patient does not show any parafunctional habits and has adequate enamel, Laminate veneers were the ideal treatment of choice. The added advantage of

the veneers includes ease of preparation and cementation. Lithium disilicate was the material of choice for this case as it provides a high esthetic outcome, more characterization, and overcomes the disadvantage of composite restoration. Even Though they are prone to fracture, they have a good bond ability to enamel and merge to the tooth surface as one. Since the Emax veneers are highly glazed and CAD-CAM milled they provide resistance to plaque accumulation, it is imperative to use a soft toothbrush and flossing to prevent marginal leakage. Since the Glass ceramic veneers are translucent care should be taken on shade selection which depends on the thickness of restoration and shade of the underlying cement. The color masking ability of ceramics used for veneers is significantly affected by the thickness of the veneer and the shade of the luting agent used. Several clinical studies have reported veneer of thickness 0.5 mm and the use of opaque cement effectively masks the underlying discoloration of fluorosis teeth while retaining the optical properties ^[11]. Even Though composite veneers are widely considered for various aesthetic reconstructions, ceramic veneers have found themselves to provide high aesthetic outcomes, and excellent translucency thus mimicking the natural tooth structure.

Conclusion

Laminate veneers are one of the most popular treatments of choice for aesthetic correction in dentistry. Even Though the material is brittle and debonding of the restoration can occur, Ceramic veneers of minimal thickness done with proper protocols provide satisfactory aesthetic outcomes while preserving the underlying tooth structure. In certain special cases such as internal discoloration like antibiotic stains, and fluorosis, the laminate veneers play a vital role in restoring the esthetics, form, and function without

causing further loss to the underlying tooth structure. In this above-mentioned case, the patient's smile has been rehabilitated using Glass ceramic veneers by meticulously following the protocols of preparation, bonding, and cementation. Thus, the Success of any treatment plan relies upon the thorough investigation and planning of the clinical condition and execution of the treatment protocol by the clinician.

References

1. Rajtilak, G., et al. "Anterior teeth and smile designing: a prospective view." International Journal of Prosthodontics and Restorative Dentistry 2.3 (2012): 117-27.
2. Femin Jilta, C.; Sreeraj, R. S.1; Ravichandran, R.; Harsha Kumar, K.. Rehabilitating a Maxillectomy Patient by Interdisciplinary Alveolar Bone Preservation Technique Using Submergence of Teeth Roots. Journal of Interdisciplinary Dentistry 10(3):p 126-131, Sep-Dec 2020. | DOI: 10.4103/jid.jid_17_19
3. Gupta T, Sadana G, Rai HK. Effect of Esthetic Defects in Anterior Teeth on the Emotional and Social Well-being of Children: A Survey. Int J Clin Pediatr Dent. 2019 May-Jun;12(3):229-232. doi: 10.5005/jp-journals-10005-1628. PMID: 31708620; PMCID: PMC6811947.
4. Sowmya, S., et al. "Esthetics with veneers: a review." International Journal of Dental Health Concerns 1.1 (2015): 1-5.
5. G Kumar, Neeraj, et al. "Veneer in restorative dentistry." Asian J Oral Heal Allied Sci 2.1 (2012): 17-25.
6. Pincus CR. Building mouth personality. Journal of South California Dental Association 1938;14:125-9.

7. Simonsen RJ, Calamia JR: tensile bond strength of etched porcelain[abstract 1154]. J Dent Res 1983;62:297.
8. Calamia JR, Simonsen RJ: Effect of coupling agents on bond strength of etched porcelain[abstract 79]. J Dent Res 1984;63:179.
9. Öztürk, Elif, et al. "Shear bond strength of porcelain laminate veneers to enamel, dentine and enamel–dentine complex bonded with different adhesive luting systems." Journal of dentistry 41.2 (2013): 97-105.
10. Nicholls, J. I. "Tensile bond of resin cements to porcelain veneers." The Journal of prosthetic dentistry 60.4 (1988): 443-447.
11. Rozier RG (1994) Epidemiologic indices for measuring the clinical manifestations of dental fluorosis: overview and critique. Adv Dent Res 8:39–55
12. Binalrimal, Sultan. "Esthetic treatment of severe dental fluorosis using porcelain veneers: A case report." Medical Science 27 (2023): e97ms2827.
13. Swift Jr. Bonding to fluorosed enamel. J Esthet Restor Dent. 2009; 21(3):147-8.
14. Horn RH. Porcelain laminate veneers bonded to etched enamel. Dent Clin N Am. 1983;27:671–84.
15. Reshad M, Cascione D, Magne P. Diagnostic mock-ups as an objective tool for predictable outcomes with porcelain laminate veneers in esthetically demanding patients: A clinical report. J Prosthet Dent. 2008;99(5):333–9.
16. Ratnaweera, Priyadarshanee M., et al. "Microtensile bond strength of porcelain laminate veneers bonded to fluorosed teeth." Journal of Prosthodontics: Implant, Esthetic and Reconstructive Dentistry 18.3 (2009): 205-210.

Legend Figures

Figure 1:



Figure 2:



Figure 3:



Figure 4:



Figure 5:



Figure 6:



Figure 7:



Figure 8:



Figure 9:



Figure 10:



Figure 11:



Figure 12:



Figure 13:

