ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at: www.ijdsir.com
Volume – 2, Issue – 1, January - February - 2019, Page No. : 242 - 247

Smile Makeover with Ceramic Laminates – A Solution for the Discolored Teeth

[1]Dr Kondumahanti V N Avinash, Post-Graduate Student, AECS Maaruti College of Dental Sciences and Research Center, Bangalore

[2]Dr Subash Munireddy, Professor, AECS Maaruti College of Dental Sciences and Research Center, Bangalore

[3]Dr Jayakar Shetty, Professor and Head, AECS Maaruti College of Dental Sciences and Research Center, Bangalore

[4]Dr Chiranjeevi Reddy G , Professor, AECS Maaruti College of Dental Sciences and Research Center, Bangalore

[5]Dr Venkat Raghu, Post-Graduate Student, AECS Maaruti College of Dental Sciences and Research Center, Bangalore

Corresponding Author: Dr Kondumahanti V N Avinash, Post-Graduate Student, AECS Maaruti College of Dental Sciences and Research Center, Bangalore, India

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Discolored teeth cause unaesthetic smile which often lowers the self esteem of a person. There are various reasons for the discoloration of the teeth. Flourosis which is endemic in various parts of world is also one of the major causes of the discoloration. Various treatment options are available to conceal the discoloration. Ceramic laminates is one such option. This is a case report of smile enhancement with ceramic laminates.

Introduction

Esthetics is of prime importance for the social wellbeing of a person. Badly discolored tooth will reduce the esthetics, thus reducing the self-confidence of the person. It was the responsibility of the esthetic dentist to enhance the smile of such patients.

Fluorosis is one of the many causes of tooth discoloration. There are various treatment options for such conditions [1]. Bleaching and composites seem not to be preferred because the effect of bleaching may be transient and composite may chip off [2, 3]. Pincus, in 1930, stated that ceramic laminates can be used to enhance the smile with minimal tooth reduction [4]. Ceramic laminates also offer the advantages like long-lasting color stability and excellent biocompatibility [5].

The following is one such case report of smile enhancement of enamel fluorosis patient with ceramic laminates.

Case Report

A 26-year-old patient came to the Department of Prosthodontics with a chief complaint of discolored teeth and wants to be corrected. On clinical examination, it was observed that all the permanent teeth were affected by dental fluorosis [fig-1] characterized by loss of enamel in irregular areas. It can be scaled to 5-7 in Thylstrup and Fejerskov index [6].

Treatment plan

All the treatment options were explained to the patient. Considering the advantages of the ceramic laminates patient chose ceramic laminates as his preferred treatment plan. Informed consent was taken. Anterior teeth and lower lip relation was analyzed and it was observed that

the length of the maxillary anterior teeth is excess than normal.

Teeth preparation

Before the tooth preparation a wax mockup was done and was shown to patient [fig-2, 3]. To begin the tooth preparation for the ceramic veneers, depth indicating grooves were marked used depth indication bur [fig-4]. Remaining tooth surface was reduced to the level of the grooves. Labial reduction was done in two planes. Proximal reduction was extended as lingual as possible. Incisal overlap design was finalized and the tooth reduction extended to the upper third of the palatal surface of the tooth [fig-5].

Gingival retraction was done and the impression was taken using polyvinylsiloxane impression material [fig-6]. Shade selection was done using the VITA shade guide. Temporization was done using light cure composite.

Veneer cementation

Temporary crowns were removed and the teeth surface was cleaned with pumice. The ceramic laminates were tested on the teeth for marginal fit and occlusal interferences. Upon satisfactory results, the veneers were prepared to be cemented onto the teeth. Etching was done and rinsed with water [fig-7]. The surface was dried. Petroleum jelly was applied to the proximal surface of the ceramic laminates. The bonding agent was applied to the prepared tooth surface [fig-8] and also the inner surface of the veneers and cured according to the manufacturers' instructions. Light cure luting cement was applied on to the inner surface of the ceramic laminates. The ceramic laminates were seated on to the tooth surface and the curing was done using UV light curing unit for 10 sec. The excess cement was removed and curing was completed according to the manufacturer's instructions [fig-9]. Fig-10 is showing final cementation of laminates. Fig-11 is depicting the absence of hindrance during protrusive movement. Fig- 12 is showing the pre-op and post-op photographs

Post cementation instructions were given to the patient and patient was asked to maintain his oral hygiene properly.

Upon feedback, it was observed that the patient, as well as his family, was satisfied with the treatment outcome.

Discussion

Porcelain laminate veneer can be defined as a thin, bonded ceramic restoration that restores the facial, incisal, and part of the proximal surfaces of teeth requiring esthetic restoration. [7] Conservation of tooth structure is the primary advantage associated with partial veneer crowns. Other advantages are they offer better access for oral hygiene. The gingival involvement in laminates is less than the full veneer restorations. During cementation of a partial veneer, the luting agent can escape more easily. Because of direct visibility, verification of seating is possible and cement removal are simple. After cementation, the remaining intact palatal or lingual tooth structure permits electric vitality testing. [8]

The preparation for ceramic laminates can be classified as [9]

Based on surface preparation

1. no preparation,
2. minimal preparation,
3. conservative, or conventional preparation

Based on proximal finish

1. slice
2. chamfer margin

Based on Incisal Preparation:

1. nonoverlap

a. window Preparation

b. feathered-edge preparation

2. overlap

a) butt joint

b) palatal chamfer

Based on Cervical Preparation:

1. chamfer
2. knife edge

There are three preparation designs for anterior partial veneers. They are No incisal involvement, feathered incisal edge and Incisal overlap. Incisal lapping is frequently used preparation design because it facilitates the accurate seating of veneers upon cementation and improved esthetics of incisal edge [9].

In situations like when the enamel is affected by trauma, abrasion or wearing, no preparation veneers are recommended. [10]

Veneers can be made with various materials like acrylic, composite, ceramic. IPS e-max veneer is prepared from a single block of lithium disilicate. It offers superior lifelike appearance because it's translucency. [11]

Sravanthi Y, Ramani YV, Rathod AM, Ram SM, Turakhia H did a study and found that among various materials like Alumina – CAD-CAM Procera, Lithium disilicate – Pressable IPS e.max Press, Zirconia – CAD-CAM Lava, Lithium disilicate – Pressable IPS e.max Press has better translucency. [12]

Dune and Millar stated that marginal adaptation determines the clinical longevity of porcelain laminate veneers. [13, 14] Hence, it can be understood that cementation is one of the most important parameters for success of porcelain laminate veneers.[15]

For cementation of porcelain laminate veneer, etching the surface and application composite resin luting agent is recommended. This type of cementation offers best bonding interference with least interfacial microleakage.[16]

Materdomini has reported that the contact lens effect concept can enhance porcelain veneer esthetics. [17] It states that when the veneer is cemented to tooth structure, it should blend optically with the substrate for becoming difficult to detect. To achieve translucency/opacity of porcelain veneer and translucency/opacity of luting composite must be controlled.

Insufficient clinical skills or operator experience resulted in restoration failure (especially color changes), which was found in one-third of patients. [18]

Conclusion

The clinician can effectively use the ceramic laminates in scenarios of discolored teeth as the laminates offer long lasting affect with minimal damage to the tooth structure. Like any other procedure, the treatment of discolored tooth with laminates also has some drawbacks. Dentist should keep them in his mind while treatment planning. A properly planned and executed treatment plan often will give long-lasting success.

References

1. Mella S, Molina X, Atalah E. Prevalence of endemic dental fluorosis and its relation with fluoride content of public drinking water. Revista medica de Chile. 1994 Nov;122(11):1263-70.

2. Goldstein CE. Bleaching vital teeth: state of the art. Quintessence Int. 1989;20:729-37.

3. Walls AW, Murray JJ, McCabe JF. Composite laminate veneers: a clinical study. Journal of oral rehabilitation. 1988 Sep;15(5):439-54.

4. Pincus C. R. Building mouth personality. Journal of the California Dental Association. 1938;14:125–129

5. Magne P, Magne M, Belser UC. Adhesive restorations, centric relation, and the Dahl principle: minimally invasive approaches to localized anterior tooth erosion. European Journal of Esthetic Dentistry. 2007 Sep 1;2(3).

6. Thylstrup A, Fejerskov O. Clinical appearance of dental fluorosis in permanent teeth in relation to histologic changes. Community dentistry and oral epidemiology. 1978 Dec;6(6):315-28.

7. Glossary of Prosthodontic Terms, 9th edition, Journal of prosthetic dentistry,2017; 117(5S);70

8. Rosenstiel SF, Land MF. Contemporary fixed prosthodontics. Elsevier Health Sciences; 2015 Jul 28.

9. Chai SY, Bennani V, Aarts JM, Lyons K. Incisal preparation design for ceramic veneers: A critical review. The Journal of the American Dental Association. 2018 Jan 31;149(1):25-37.

10. Alavi AA, Behroozi Z, Eghbal FN. The shear bond strength of porcelain laminate to prepared and unprepared anterior teeth. Journal of Dentistry. 2017 Mar;18(1):50.

11. Dolidze T, Bitarova I. Advantages and Dısadvantages of E-MAX and Zırconıa Crowns. European Scientific Journal, ESJ. 2017 Jan 4;12(10).

12. Sravanthi Y, Ramani YV, Rathod AM, Ram SM, Turakhia H. The comparative evaluation of the translucency of crowns fabricated with three different all-ceramic materials: an in vitro study. Journal of clinical and diagnostic research: JCDR. 2015 Feb;9(2):ZC30.

13. Dunne SM, Millar BJ. A longitudinal study of the clinical performance of porcelain veneers. British dental journal. 1993 Nov 6;175(9):317.

14. Fuzzi M, Bouillaguet S, Holz J. Improved marginal adaptation of ceramic veneers: a new technique. Journal of Esthetic and Restorative Dentistry. 1996 Mar;8(2):84-91.

15. Swift B, Walls AW, McCabe JF. Porcelain veneers: the effects of contaminants and cleaning regimens on the bond strength of porcelain to composite. British dental journal. 1995 Sep 23;179(6):203.

16. Haralur SB. Microleakage of porcelain laminate veneers cemented with different bonding techniques. Journal of clinical and experimental dentistry. 2018 Feb;10(2):e166.

17. Materdomini d, friedman mj. The contact lens effect: enhancing porcelain veneer esthetics. Journal of Esthetic and Restorative Dentistry. 1995 May;7(3):99-103.

18. Alhekeir DF, Al-Sarhan RA, Al Mashaan AF. Porcelain laminate veneers: Clinical survey for evaluation of failure. The Saudi dental journal. 2014 Apr 1;26(2):63-7.

Legends of Figure

Fig-1 pre operative picture

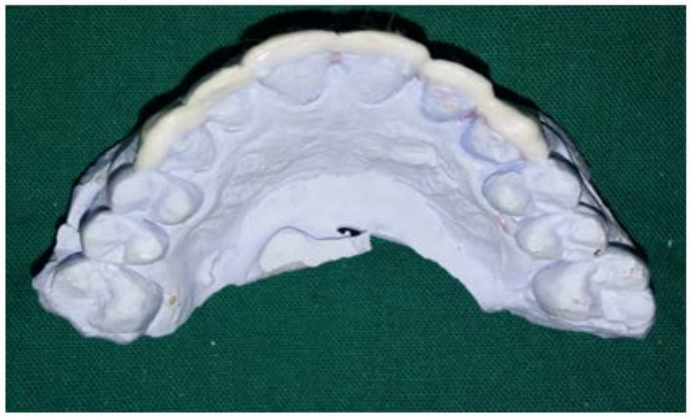

Fig-2 and 3 Wax mock up

Fig-4 initial depth indicating grooves

Fig-5 tooth preparation

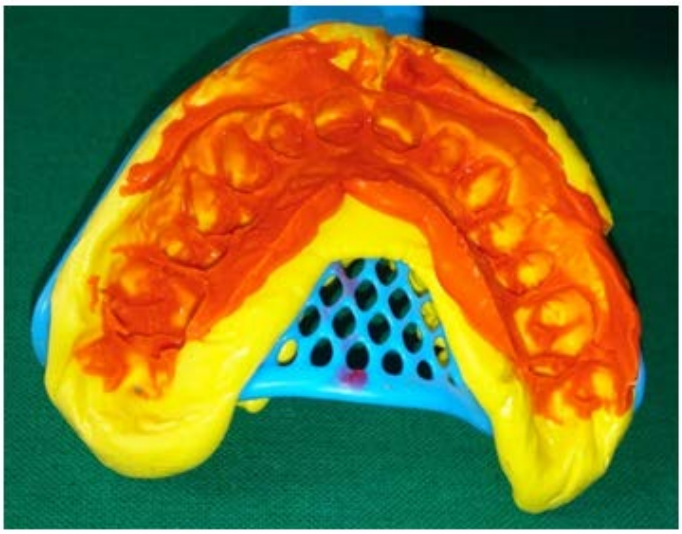

Fig-6 Impression

Fig-7 acid etching of the tooth

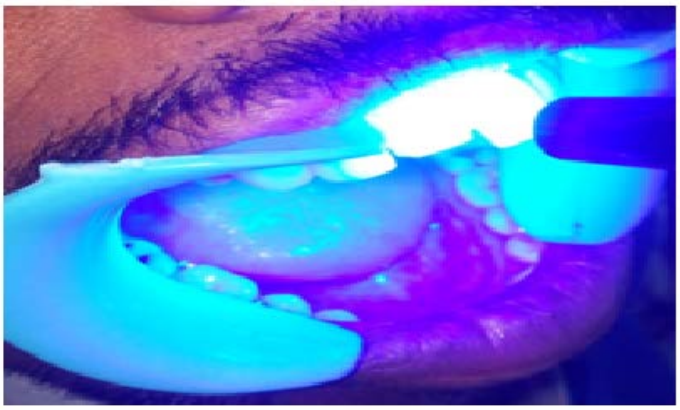

Fig-8 Application of bonding agent and curing

Fig-9 cementation

Fig-10 Final laminates

Fig-11 protrusive movements showing no anterior hindrances

Fig-12 Pre-op and post-op views