Short Communication

Difference in clinical performance between porcelain laminate veneer restoration and high-flow composite resin coating

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Abstract

This report describes about difference in clinical performance, especially service period, between porcelain laminate veneer restoration and resin coating applied to the enamel surface. Porcelain laminate veneers were seated to maxillary incisors and canines with a resin-based luting system, whereas resin coating technique was applied to mandibular incisors of a female patient with discolored dentition. The porcelain laminate veneers survived for more than 28 years, whereas longevity of resin coating was limited to shorter period. Although clinical procedure, surface preparation, and bonding system vary considerably, a number of options are currently available for patients with severely discolored dentition.

(Asian Pac J Dent 2021; 21: 11-12. doi: 10.47416/apjod.21-0281)

Key Words: adhesive, bonding, coating, high-flow composite, porcelain laminate veneer**Introduction**

Laminate veneer, direct composite resin, bleaching, and other techniques are being applied to the patient with discolored teeth. It is desirable for patient that reduction of tooth structure is not necessary or minimal until completion of esthetic dental treatment. One of the problems associated with bleaching or coloring of vital tooth is adhesive performance of restorative material. This report compared clinical performance of porcelain laminate veneer restoration and resin coating applied to a patient with multiple discolored teeth.

Porcelain laminate veneer restoration and resin coating

Six porcelain laminate veneer restorations were seated to an 18-year-old female patient. Clinical procedure and materials employed are shown in a previous report [1]. The authors reported that all porcelain laminate veneer restorations survived for 24 years and 8 months after seating (Figs. 1-3) [1]. Figure 4 shows the facial view taken after observation period of 28 years and 3 months. Although gingival recession as well as slight change in maxillomandibular occlusal relationship is observed, maxillary porcelain laminate veneers are functioning satisfactorily.

Fig. 1
Pre-operative view of discolored dentition

Fig. 2
Porcelain laminate veneers seated to maxillary teeth [1]
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Table 1 Materials and service period of bonding systems employed

Technique/Adherend	Adherend	Etching	Bonding agent	Luting/Coating agent	Service period
porcelain laminate veneer	13, 12, 11, 21, 22, 23	HF etching	silane/4-META	TBB resin and	28 y 3 m for
enamel	reduction within enamel	H ₃ PO ₄ etching	4-META	composite resin	all six teeth
resin coating	32, 31, 41, 42			high-flow composite	32 less than 2 y
enamel	no reduction, polished	H ₃ PO ₄ etching	4-META		31 less than 1 y
					41 more than 5 y
					42 less than 2 y

Fig. 3
Porcelain laminate veneers 24y-8m after seating [1]
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Fig. 4
Porcelain laminate veneers 28y-3m after seating

As shown in Fig. 3, high-flow composite resin coating material (AQ Bond SP, Metafil Flo Opaque, Sun Medical, Moriyama, Japan) has been applied to mandibular four incisors before the recall visit [2]. However, one of the four coatings, tooth 31, appeared to be detached or worn within 1 year. In addition, two coatings, teeth 32 and 42, also detached from the enamel surface within 2 years. Only the coating on the tooth 41 is surviving for more than 5 years. Table 1 compares service period of the two techniques applied to the patient.

Discussion

Longevity of porcelain laminate veneer bonded to enamel appears to be satisfactorily as shown in the current report as well as literature [3,4]. One of the disadvantages associated with laminate veneer technique, compared with resin coating, is reduction of intact enamel. Coating enamel surface with high-flow opacous composite resin is an alternative technique for hiding discolored tooth structure [5-8]. Service period of materials employed in this technique is probably influenced by abrasion of coated layer and durability of bond of the bonding systems. Also etching efficacy by phosphoric acid considerably depends upon elimination of contaminant and biofilm formed on enamel surface. Care must be taken for enamel surface preparation prior to acid etching.

Conflicts of Interest

The authors declare that there are no conflicts of interest related to the manuscript.

References

1. Nakamura M, Matsumura H. The 24-year clinical performance of porcelain laminate veneer restorations bonded with a two-liquid silane primer and a tri-n-butylborane-initiated adhesive resin. *J Oral Sci* 2014; 56: 227-30.
2. Nemoto M, Koizumi H, Matsumura H, Tanoue N. Single-visit tooth coloration with enamel bonding system and high-flow composites: A clinical report. *Int Chin J Dent* 2004; 4: 97-9.
3. Arif R, Dennison JB, Garcia D, Yaman P. Retrospective evaluation of the clinical performance and longevity of porcelain laminate veneers 7 to 14 years after cementation. *J Prosthet Dent* 2019; 122: 31-7.
4. Gresnigt MMM, Cune MS, Jansen K, van der Made SAM, Özcan M. Randomized clinical trial on indirect resin composite and ceramic laminate veneers: Up to 10-year findings. *J Dent* 2019; 86: 102-9.
5. Imamiya C, Shimada Y, Burrow MF, Tagami J. Shear bond characteristics of a tooth-colored temporary coating material to enamel. *Am J Dent* 2007; 20: 177-81.
6. Manabe A, Kato Y, Finger WJ, Kanehira M, Komatsu M. Discoloration of coating resins exposed to staining solutions in vitro. *Dent Mater J* 2009; 28: 338-43.
7. Takenaka S, Wakamatsu R, Ozoe Y, Tomita F, Fukushima M, Okiji T. Translucency and color change of tooth-colored temporary coating materials. *Am J Dent* 2009; 22: 361-5.
8. Emoto M, Tomita K, Kanemaru N, Tokuda M, Torii M. Development of surface coating material for discolored tooth equipped with bleaching effect. *Dent Mater J* 2012; 31: 797-805.

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Received May 6, 2021, Accepted June 14, 2021, Available online June 28, 2021.

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