

Minimal invasive techniques in Porcelain Laminate Veneers: Case Series

Abstract

Laminate veneer is one of the most conservative of all the prosthodontic restorations. Making veneers with porcelain supplement will minimize plaque accumulation, give life-like esthetics and provides options for shade correction. Though various classical designs are described in text books, keeping minimal intervention and maximum tooth conservation as our goal this article presents a case series of 4 different types of preparation designs for laminate veneers. Different clinical conditions are presented here to illustrate the aesthetic outcome with minimal intervention.

Keywords: laminate veneer, preparation design, ceramic veneer

Volume 5 Issue 1 - 2019

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Received: February 15, 2018 | **Published:** March 22, 2019

Introduction

Porcelain laminate veneer is defined as a thin bonded ceramic restoration that restores the facial surface and part of the proximal surfaces of teeth requiring esthetic restoration (GPT 9).¹ The laminate veneer is a conservative alternative to full coverage crown for improving the appearance of discoloured, pitted or fractured anterior teeth. The tooth preparation design varies according to the indication and it is the variation in the incisal edge coverage that determines the design. Out of the four designs namely, the window design, feather edge, incisal bevel and incisal overlap design the most common designs are the feather edge and incisal overlap designs. This case series presents modifications in preparation design for highly esthetic ultraconservative preparation designs.

Case report 1

A 52year old male patient reported with erosion in the buccal surface of the central incisors. Patient refused composite filling because of previous history of discoloration and fracture of a posterior composite filling. The normal preparation for porcelain laminate veneer would have demanded reducing a substantial amount of labial tooth structure. Here only the margins of the eroded areas were smoothed and an impression in polyvinyl siloxane was made (Figure1). Modified veneer design with lithium disilicate (IPS Emax veneer) was fabricated (Figure 2). The Emax veneer was etched, silanated and bonded with resin cement (Variolink 2) (Figure 3).



Figure 1 Labial defect in relation to I1 and 21 and preparation design.

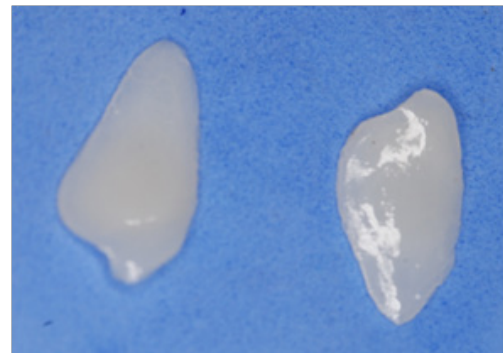


Figure 2 Emax laminate veneer.



Figure 3 Veneer after cementation.

Case report 2

A 27year old male patient reported with diastema distal to the right upper lateral incisor whereas the mesial contact was intact. On examination, the upper right lateral incisor was seen to be a peg lateral (Figure 4). A conservative preparation was done only on the distobuccal side of the lateral incisor sparing the mesial surface. The preparation extended proximally over to the lingual side as usually done with the teeth having diastema (Figure 5). Impression was made in Polyvinyl siloxane (Virtual, Ivoclar) an Emax veneer was made

(Figure 6). The veneer was etched with hydrofluoric acid, sialinated and bonded with Variolink 2 resin cement (Figure 7).



Figure 4 Peg Lateral.

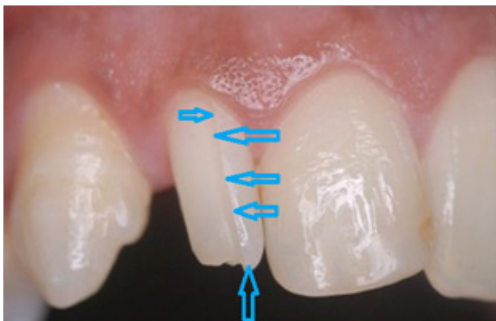


Figure 5 Modified incisal overlap preparation.



Figure 6 Emax Laminate.



Figure 7 Veneer after cementation.

Case report 3

Porcelain laminates veneer with gingival porcelain. A 23 year old

female patient reported with midline diastema and a discolored left central incisor. She had undergone orthodontic treatment 3 years before and was not willing for further orthodontic treatment. Her left central incisor was non-vital. An intra-oral periapical radiograph revealed non-vital upper left central incisor, probably due to the excessive orthodontic pressure (Figure 8). A root canal treatment was carried out for the left central incisor. Both central incisors were prepared for laminate veneers in the feather edge design incisally (Figure 9). Gingival porcelain was added to the laminate veneer matching the gingival shade of the patient to counter a mismatch with the gingival zenith of the lateral incisors (Figure 10). The lithium disilicate (IPS Emax) veneer was etched, silanated and bonded with resin cement (Variolink 2) (Figure 11).



Figure 8 Midline diastema with discolored left central incisor.



Figure 9 Feather edge preparation design in relation to 11 and 21.



Figure 10 Finished laminate veneer with gingival porcelain.



Figure 11 Bonded laminates.

Case report 4

Lumineer or no preparation veneer

Though laminate veneers are one of the most conservative of all prosthetic restorations, no-preparation veneers (Lumineers, Cerinate, Dent mat) is unique as it requires no tooth preparation at all. A patient with a fear of dental drill reported with midline diastema. The only option for her was a no-preparation veneer (Figure 12). The tooth was polished with pumice and water and the labial surface was roughened with smooth diamond bur to remove the non-prismatic layer of enamel and to remove the surface layer of enamel that would usually be a fluoride enriched layer which would prevent effective bonding of the veneer. An impression was then taken in addition silicone and sent to the lab. The lithium disilicate (IPS Emax) veneer was etched, silanated and bonded with resin cement (Variolink 2) (Figure 13).



Figure 12 Midline diastema.



Figure 13 Bonded lumineer

Case report 5

Window design

A 51 year old female patient reported with discoloured left upper first premolar due to an extensive amalgam restoration and wanted to hide the discoloration (Figure 14). On examination, it was discovered that the whole tooth had a massive amalgam filling and only a very thin shell of tooth structure on the buccal surface was remaining, contraindicating preparation for a crown. On lateral excursion, the incisal edge of the premolar was contacting the mandibular teeth. This could result in fracture of the porcelain veneer owing to the minimal tooth structure that will be present after the preparation. Hence it was decided to execute a window preparation. Buccal surface of the first premolar was prepared with a light chamfer finish line short of the incisal edge (Figure 15). An impression was made in addition silicone and sent to the lab. The lithium disilicate (IPS E max) veneer was etched, silanated and bonded with resin cement (Variolink 2) to result in a beautiful restoration that aesthetically camouflaged the amalgam tattoo (Figure 16).



Figure 14 Amalgam tattooing of the left first premolar.



Figure 15 Window preparation design.



Figure 16 Bonded laminate.

Discussion

A porcelain laminate veneer is an extremely thin shell of porcelain applied directly to tooth structure. Indications of laminate veneers may be discoloured teeth, adolescent teeth (teeth with large pulp), root exposure, stained teeth, malformed crowns (e.g. peg laterals), diastema, to increase the length of the tooth (crown lengthening), discoloured tooth, root exposure, defective restorations, and fractured edges.² In past most of these cases were indicated for full crowns but presently advancements in adhesive dentistry and restorative materials have revolutionized cosmetic dentistry as minimal invasive techniques.³

Though laminate veneers are minimally prepared restorations, the cases described here shows unique ways of preparing laminate veneers with maximum conservation of tooth structure meeting the patient's aesthetic requirements whilst maintaining periodontal health. Different materials used to fabricate veneers are feldspathic ceramics, alumina, and glass infiltrated zirconia. In this case series Emax have been selected which is lithium disilicate glass ceramic which is highly durable.⁴ Dumfahrt et al.,⁵ on his retrospective evaluation on porcelain veneers concluded that they have 91% survival at 10.5 years provided the veneer is within enamel with supra gingival finish lines.⁵ Barghi et al.,⁶ observed that proper etching depend on the leucite content of porcelain and type of etchant used.⁶ However teeth with defective enamel formation, parafunctional habits, severe periodontal involvement, severe crowding are not ideal for any type of veneers.⁷

Conclusion

The goal of any restoration should be preservation of existing tooth structure than its meticulous replacement. This article highlights the various minimally invasive techniques that can be employed in the preparation of laminate veneers. Minimally invasive techniques

are conservative and aid in providing the patient optimal esthetics. Deviating from the classic over prepared tooth preparations minimal invasive techniques conserve maximum of tooth structure while providing a highly esthetic and functional restoration.

Acknowledgments

None.

Conflicts of interest

The author declares no conflicts of interest.

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