

Management of Spacing in Mandibular Anterior Teeth by Minimally Invasive Technique Using Laminates: A Case Report

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Abstract

People have become increasingly concerned about esthetics as a perfect smile gives patients more confidence and make them feel comfortable in social circumstances. Esthetic dental treatment plays an important role in improving personal appearance. Advances in dental materials have led to innovations in porcelain laminate veneers and bonding materials which has improved the overall quality of the esthetic restorations. This case report describes the rehabilitation of a patient with spacing in mandibular anterior teeth, who was concerned with his facial appearance, with ceramic laminate veneers.

Key words: Laminate veneers; Minimally invasive techniques; Spacing.

Introduction

Concerns regarding dental problems has augmented among patients these days, so is their desires for most esthetic and functional treatment outcomes. Dental spacing causing unappealing smile is a common problem which may be corrected via orthodontic interventions. However, time limitations and cost factor may preclude such treatments at times. Restoring the spacing in anterior teeth can be done with porcelain laminate veneers.¹ Veneer is a layer of tooth colored material that is applied to the tooth surface to restore localized or generalized defects, which has advantage of superior esthetics giving restoration a life like appearance and being conservative compared to conventional crowns or fixed partial dentures.

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Case Report

A 22-year-old male patient visited Department of Prosthodontics and Crown-Bridge, College of Dental Surgery, B.P. Koirala Institute of Health Sciences, Nepal with a chief complaint of open spaces in lower anterior teeth. (Fig. 1A) On clinical examination, teeth appeared smaller in size with average spacing of each 2mm between the two central incisors, central and lateral incisors on both sides. (Fig. 1B) Oral hygiene was fair and radiographic examination showed no abnormality.

All the treatment modalities were discussed with the patient including orthodontic treatment. But due to time constraints patient denied orthodontic innervations and opted for laminate veneers as it was conservative, less time consuming and displayed prompt results. Diagnostic impressions were made with irreversible hydrocolloid impression material (Algitec, Dental Products of India) and poured with Type II dental stone (Kalastone, Kalabhai Pvt. Ltd.). Diagnostic wax up was done for mandibular anterior teeth for anticipation of

the size, form and proportion of the teeth. (Fig. 2A) Direct composite mock-up was done for communicating final treatment outcomes to the patient. (Fig. 2B)

Silicone indexes using putty consistency rubber impression material (Polyvinyl siloxane, Coltene) were made over the diagnostic wax up, one for temporization and other as reduction guide. Shade selection was done prior to tooth preparation using shade guide (Vitapan Classical shade guide).

Initial depth cut of 0.3 mm was made using three tired depth cutter bur for labial reduction. Once the desired depths were achieved and horizontal grooves were prepared, (Fig. 3A) labial reduction was completed using tapered round end fissure bur. Incisal preparation included overlap design (Fig. 3B) and all the corners and the line angles were rounded to reduce internal stresses. (Fig. 3C)

Soft tissue management was done by gingival retraction cord prior to impression making. Single step double mix putty wash impression was made with Vinyl polysiloxane impression material to record details of the tooth preparation. Impression was removed, rinsed, inspected and finally disinfected with

2% glutaraldehyde solution (Fig. 3D) and sent to laboratory for fabrication of laminate veneers with lithium disilicate ceramics (IPS e.max, Ivoclar Vivadent). Mock up, along with pictures of provisional restorations and desired shade of veneers were communicated with the laboratory. Provisional laminates, which were prepared using tooth colour acrylic material in the prepared silicone index, were luted with provisional cement. (Fig. 4).

In the next appointment, definitive laminate veneers were ready for cementation. (Fig. 5A) Provisional restorations were removed and the prepared teeth surface were cleaned and pumiced to remove any remnants of provisional luting cements. The laminate veneers were tried intra orally to see their fit, form, position and shade. Once these were satisfactory, they were finally luted with resin cement. (Fig. 5B). A short light curing of 5 seconds was done to stabilize the position of the laminate and excess cement was removed and inter dental cement was removed using dental floss. Final curing was carried out for 60 seconds. The patient was satisfied with the outcome of the treatment. (Fig. 5C, 5D) He was recalled for follow up after a day, 1 week, 1 month and 6 months, veneers were functioning satisfactorily.



Figure 1A: Intra oral preoperative view



Figure 1B: Open spaces in lower anterior teeth



Figure 2A: Diagnostic wax up done over mandibular anterior teeth



Figure 2B: Intraoral composite mock up



Figure 3A: Depth cut using three tier bur



Figure 3B: Incisal preparation with overlap type design



Figure 3C: Final teeth preparation



Figure 3D: Impression made with polyvinyl siloxane material



Figure 4: Provisional restoration fabricated from the putty index



Figure 5A: Final laminates



Figure 5B: Laminates luted with resin cement



Figure 5C: Post treatment view showing closing of spaces between mandibular anterior teeth using laminate veneers.



Figure 5D: Post treatment extraoral view

Discussion

With the increase to access of information regarding different dental treatments, through internet, books or magazines, people have become more demanding in terms of esthetic outcomes which should be closely associated with the patient's wishes, respecting the principles of smile harmony. There are several options for treating anterior spaces such as composite restorations, full veneer crowns and laminates. According to Nathanson and Riis², Giordano³, Van Dijken⁴ and Holand et al.⁵ ceramic restorative materials is the best choice since composite resins exhibit lower clinical longevity due to greater susceptibility to pigmentation and marginal fractures⁶ and require regular maintenance.

In this clinical report, ceramic laminates were chosen because this material has the ability to reproduce the appearance of natural teeth, good

translucency, excellent resistance, and similar biomechanical behavior as the tooth structure.

In this case overlap type of incisal preparation was done. Garber^{7,8} advocated the palatal chamfer preparation design (overlap type) if the incisal edges are thin buccolingually. The overlap type design increases the surface area for bonding and avoids a sharp angle which may propagate cracks.^{7,8} Sheets and Taniguchi⁹ believed that the palatal chamfer design provides adequate ceramic thickness at the incisal edge.

Conclusion

This clinical report presented the esthetic management of treatment of spacing in the mandibular anterior teeth with ceramic veneers. Proper case selection, detailed planning and precise execution of treatment sequence and respecting patient's wishes is mandatory for successful outcome. Time and cost factors

should be considered as important determinants for the selection of the treatment. The diagnostic wax-up is a significant tool for analysing the proposed treatment and communicating with the dental team and the patient. The performed procedure here corresponded very well with expectations of the patient and obtained a satisfactory result.

References

1. Garber DA. Porcelain laminate veneers: 10 years later. Part 1. Tooth preparation. *J Esthet Dent* 1993;5:56-62.
2. Nathanson D, Riis D. Advances and current research in ceramic restorative materials. *Curr Opin Cosmet Dent*. 1993; 2:34–40.
3. Giordano RA. Dental ceramic restorative systems. *Compend Contin Educ Dent*. 1996;17:779–82.
4. Van Dijken V JW. All-ceramic restorations: classification and clinical evaluations. *Compend Contin Educ Dent*.1999;20:1115–24.
5. Holand W, Schweiger M, Watzke R, Peschke A, Kappert H. Ceramics as biomaterials for dental restoration. *Expert Rev Med Devices*. 2008; 5:729–745.
6. Miranda ME, Olivieri KA, Rigolin FJ, Basting RT. Ceramic fragments and metal-free full crowns: a conservative esthetic option for closing diastemas and rehabilitating smiles. *Oper Dent* 2013; 38:567–71.
7. Garber DA. Rational tooth preparation for porcelain laminate veneers. *Compendium*.1991; 12:316-20.
8. Garber D. Porcelain laminate veneers: ten years later: Part I Tooth preparation. *J Esthet Dent*. 1993; 5: 56-62.
9. Sheets CG, Taniguchi T. Advantages and limitations in the use of porcelain veneer restorations. *J Prosthet Dent*. 1990;64:406-11.