

# Management of Spacing in Maxillary Anterior Teeth by Minimally Invasive Techniques Using Laminate: A Case Report

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## ABSTRACT

**Introduction:** In today's dental practice one of the biggest challenges of the dentist is to restore spacing in anterior teeth when orthodontic treatment is not feasible, because of increasing aesthetic concern and patient's expectation for natural looking smile. An unpleasant smile traumatizes the patient psychologically, loses the self confidence and is a cause of social embarrassment. There are several treatment options available to enhance the aesthetic and beauty of smile like composite restorations, full veneer crown, laminates to more complex treatment involving surgical procedures.

**Case report:** This case report is about a young male patient who reported with a complaint of open spaces in upper anterior teeth with a desire to enhance the aesthetics and smile. He was successfully treated with laminate veneers by following minimally invasive techniques using aesthetic pre-evaluative temporaries (APT). Veneers fabricated using lithium disilicate and bonded with resin cement.

**Conclusion:** In today's Dental Practice, the concept of minimal invasive procedure for preservation of tooth structure, laminate veneers would be the ideal choice for restoring spacing between anterior teeth.

**Keywords:** Spacing, Laminate Veneers, Minimally Invasive Techniques, APT.

## INTRODUCTION

Enhancement of aesthetics of anterior teeth is one of the challenges of the dentist. patient may present with teeth which may be discoloured, attrited, fractured, malaligned or open space between the teeth. These open spacing or malalignment of teeth are due tooth material and jaw size discrepancy. These are usually corrected by orthodontic treatment, but sometime this is not possible, due to some limitation, like time and cost.

Restoring the spacing in anterior teeth can be done with either direct composite veneering or with porcelain laminate veneers.<sup>1</sup> Restoring the spacing with the help with porcelain laminate veneers using APT is the most conservative and aesthetic approach. They have the advantage of having superior aesthetics giving restoration a life like appearance. To achieve predictable result it is important to understand the selection of all ceramic material, the bonding of porcelain using resin cement with underlying tooth substance.<sup>3</sup>

## CASE REPORT

A 22 years old male patient visited the Department of Prosthodontics Crown and Bridge, in Dr R Ahmed Dental College and Hospital, Kolkata, with a chief complaint of open spaces in upper anterior teeth with a desire to close the

spacing and to enhance the aesthetics and smile (fig-1).

Patient is pleasant looking man until he smiled. The spacing between the teeth did not compliment his facial features. The teeth appeared smaller in size with average spacing of 2mm each, between the two central incisors, central and lateral incisors and lateral incisor and canine on both sides of midline. Left lateral incisor was slightly distally rotated. Oral hygiene was good. Radiographic examination showed no abnormality.

## Treatment

Orthodontic opinion was considered, where they opined that it was due to jaw size and tooth size discrepancy. Orthodontic treatment would have been a long time process, to which patient did not agree. Patient was given the option of porcelain laminate veneer, since it was minimal invasive technique, less time consuming and with immediate result. Upper and lower diagnostic impression were made with irreversible hydrocolloid, alginate impression material and poured with type iii dental stone. Diagnostic wax up was done over maxillary anterior teeth to get proper idea of the size, form and proportion of the teeth. This was finally presented to the patient and approval was taken. The finalization of laminate was done at the time of intraoral composite mock up.<sup>4</sup>

Silicone index using putty consistency rubber impression material from 3M ESPE was made over the diagnostic wax up cast, one for temporarization and other as reduction guide. Shade selection was done prior to tooth preparation using Vitapan Classical shade guide and shade selected was B1.

In the silicone index tooth colour acrylic resin was applied in the region where laminate was planned and this was placed over the unprepared tooth to get the intra oral mock up. These were called aesthetic pre-evaluative temporaries (APT). They were evaluated both by dentist and the patient and final approval was taken.

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**How to cite this article:** Anindita Majumder, Sreya Chowdhury, S Mukherjee, T K Giri. Management of spacing in maxillary anterior teeth by minimally invasive techniques using laminate: a case report. International Journal of Contemporary Medical Research 2018;5(4):D1-D3.

**DOI:** 10.21276/ijcmr.2018.5.4.5



**Figure-1:** Pre treatment extra oral photograph



**Figure-2:** Reduction through Aesthetic Pre-evaluative Temporaries.



**Figure-3:** Tooth preparation showing window preparation for veneers



**Figure-4:** Post treatment photograph showing closing of spaces between maxillary anterior teeth using laminate veneers.

As minimum preparation was required, reduction was carried out through the temporaries. Initial depth cut of 0.5mm was given using three tired depth cutter bar for labial reduction. Once the desired depths are achieved and horizontal grooves are prepared, remaining part of APT is removed. facial surface of tooth is painted with waterproof paint to enhance contrast between prepared and unprepared tooth portion. These contrasted horizontal will remain painted until the desired depth of labial reduction is uniformly achieved using tapered round end fissure bur (fig:2). Labial reduction

completed.

Then supragingival deep chamfer finish margin is produced which preserves tooth structure than shoulder and also produces gradual colour transition between tooth and restoration. inter-proximal reduction is carried to produce short wrapping, which will extend only on the facial margin of inter dental region of the tooth. incisal preparation includes window or intra enamel preparation in which 1mm incisal edge is preserved. It is the most conservative preparation.<sup>5</sup> Finally all corners and line angles are rounded it reduces internal stresses (fig:3).

Soft tissue management was done by gingival retraction cord prior to impression making. Stock metal tray was selected and coated with tray adhesive (Tray fix, Dentsply). Vinyl polysiloxane impression material of putty and light body consistency was used to make single step double mix impression to get details of the tooth preparation. light body was syringed on the prepared teeth and spread gently so that entire preparation is covered and no air bubble exist. a simultaneously mixed putty material was loaded on stock tray and inserted over the light body material and was kept in place till it was completely set.

Impression was removed from mouth and then rinsed, inspected and finally disinfected with 2% glutaraldehyde solution and sent to laboratory for fabrication of laminate veneers with lithium disilicate ceramics (IPS e.max IVOCLAR VIVADENT). Mock up, along with pictures of aesthetic pre-evaluative temporaries in mouth was also sent to laboratory. The technician was also instructed for the shade of veneers.

Another set of provisional laminates were prepared using tooth colour acrylic material in the prepared silicone index. These laminates were then finished, polished and luted to the teeth with resin cement after spot etching.

**Luting of laminates:** The provisional laminates were removed, once the final laminates were prepared. the surface of the prepared teeth 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 to the patient, they were finally luted with resin cement. The luting procedures were carried out initially over the central incisors, followed by lateral incisors, and finally the canines.

The inner surfaces of the veneers were etched, using 5% hydrofluoric acid for 10 seconds, and rinsed thoroughly, while the teeth surfaces were etched using 37% orthophosphoric acid for 30 seconds and rinsed. veneers were air dried, and silane coupling agent was applied over the etched surface. the teeth were coated with bonding agent, and air dried. resin cement was coated over the veneers and tooth surface. Laminates were positioned with care from the cervical finish margin to the incisal edge for proper fitting.<sup>6</sup>

A short light curing of 5 seconds was done to stabilize the position of the laminate and excess cement was removed. inter dental cement was removed using dental floss. Later final curing was carried out for 60 seconds. While etching and curing adjacent teeth were protected using a plumber's

tape.

After luting of all six veneers patient was satisfied and happy with the outcome of the treatment.(fig:4). He was recalled for follow up after a day, 1 week, 1 month and 6 months and he was functioning satisfactorily.

## DISCUSSION

There are several options for treating anterior spaces such as composite restorations, full veneer crown, laminates. Among all laminates are the most conservative with minimum tooth preparation and have the advantage of resistance to discolouration unlike composites.

Treating patient with porcelain laminates using aesthetic pre evaluative temporaries helped both dentist and the patient to visualize and analyze the final outcome, which saved the chair side time and also helps to preserve the enamel to get more effective bonding between laminates and tooth surface using resin cement.<sup>2</sup> In this case a Window preparation for incisal edge was carried out. Similar study in 2009 by Ghani Mirra and Salem Mahalawi found that butt preparation has the highest fracture strength as compared to feather edge and incisal overlap preparation.

The veneers were fabricated from Lithium Disilicate ceramic having high translucency and strength compared to low fusing feldspathic porcelain. Thineers have also been a choice for minimal preparation. however, in this case, thineers are not indicated because of wider gap between the teeth.

## CONCLUSION

In today's Dental Practice, the concept of minimal invasive procedure for preservation of tooth structure, laminate veneers would be the ideal choice for restoring spacing between anterior teeth. If properly executed, following a strict protocol of evaluation, pre evaluative temporisation, tooth preparation, properly selected all ceramic material, bonding will enhance the aesthetic outcome and long term success can be achieved.

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**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 20-03-2018; **Accepted:** 16-04-2018; **Published:** 29-04-2018