

TIPS FROM OUR READERS

Modified clear silicone index for light-polymerizing direct composite resin restorations

Smita Kole, BDS,^a Udatta Kher, BDS, MDS,^b and Pravinkumar G. Patil, BDS, MDS^c

Light-polymerizing composite resins have been commonly used to restore the esthetics and function of anterior and posterior teeth^{1,2}. Creating an ideal tooth morphology with direct composite resin is challenging, time consuming, and requires artistic skill, especially when multiple teeth are being restored. The procedure is simplified with the use of an index.³ Conventionally, a putty elastomeric impression material is adapted to a waxed cast to fabricate an index.³ However, light cannot pass through the opaque material. Alternatively, a transparent thermoformed sheet can be used to create an index but may not be sufficiently rigid to maintain the contour and requires the additional step of duplicating the waxed cast. Composite resin restorations have been placed in anterior teeth with a putty index alone or with a putty index combined with a flexible matrix such as polytetrafluoroethylene (Teflon) tape⁴ or a mylar strip.⁵ The flexible matrix is difficult to manipulate around the teeth and past the contact area.

Alternatively, a transparent silicone index can be used. However, this can be difficult to fabricate because of the silicone's sticky consistency. The present technique describes the straightforward fabrication of a clear silicone index supported by the opaque putty which can be used effectively to place multiple direct composite resin restorations. It enables transfer of the tooth morphology from the waxed cast to the mouth and also polymerization of the composite resin through the transparent silicone material. The putty provides

rigidity to the index, and the clear silicone enables the use of light-polymerizing composite resins. This technique can be used to restore single tooth or multiple teeth in the anterior or posterior regions of the mouth.

TECHNIQUE

A patient requiring composite resin restorations on the maxillary left and right central incisors, lateral incisors, and canines is described. The diagnostic cast was waxed to develop esthetic anatomic contours.

1. Mix a polyvinyl siloxane (PVS) putty impression material (Soft Putty; 3M ESPE) to prepare an index on the waxed cast (Fig. 1A). Ensure that the putty index extends at least 1 tooth anterior and 1 tooth posterior to the tooth or teeth to be restored.
2. Cut a window in the putty index to expose the occlusal and axial tooth morphology of the teeth to be restored (all 6 maxillary anterior teeth for this patient) using a surgical blade no. 15 (Surgeon) and handle (PARAMOUNT SURGIMED) (Fig. 1B).
3. Inject a clear silicone material (Elite Glass; Zhermack) into the window using the automixing dispenser (Fig. 1B).
4. Adapt a cellophane sheet (RVG Sensor Sleeves; Oro) to the clear silicone material as shown in Figure 1C. Note that the cellophane sheet helps shape the clear silicone into the window of the PVS

^aPrivate practice, Dr Kole's Dental Clinic, Raviwarpeth, Solapur, Maharashtra, India.

^bPrivate practice, Mumbai, Maharashtra, India.

^cSenior Lecturer, Department of Prosthodontics, Division of Clinical Dentistry, School of Dentistry, International Medical University, Kuala Lumpur, Malaysia.

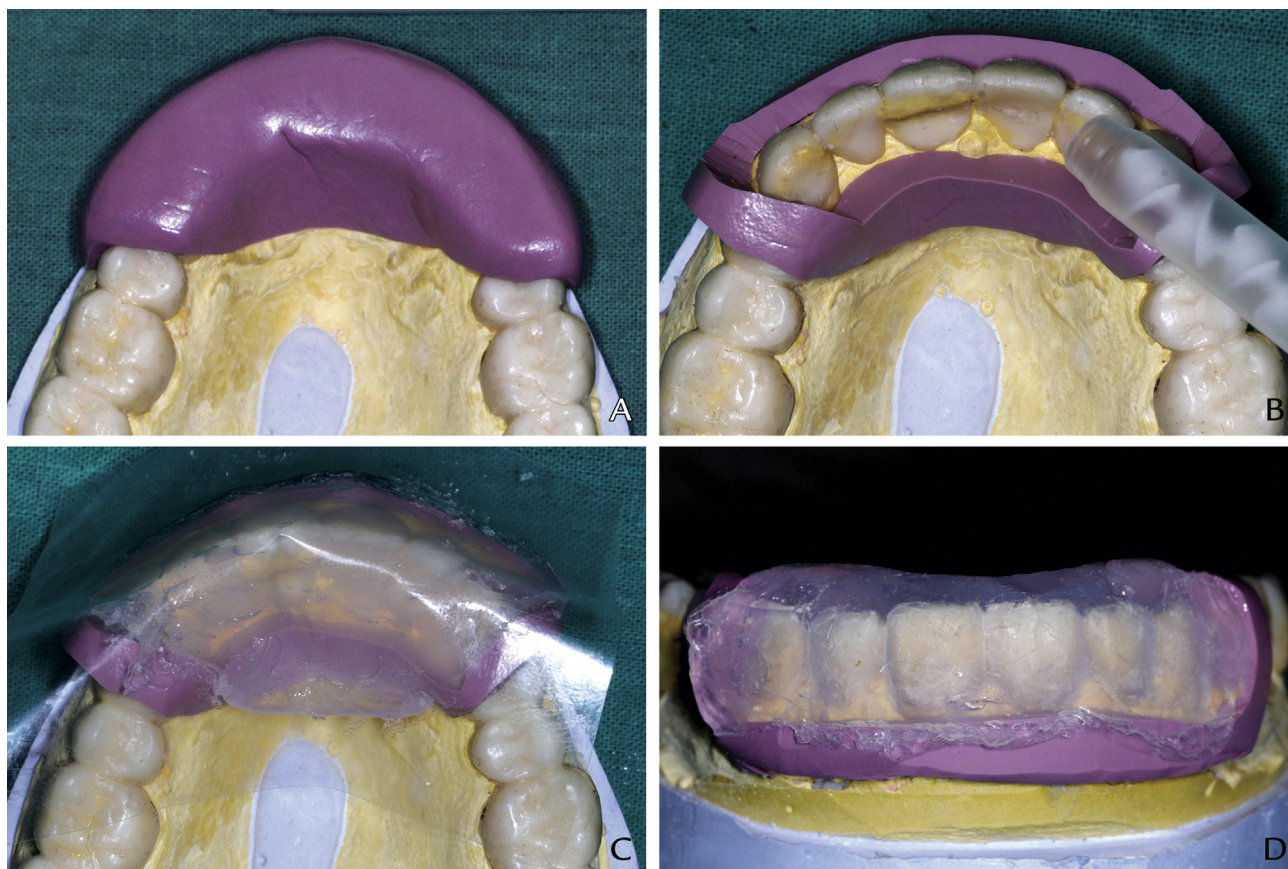


Figure 1. A, Opaque putty elastomeric index. B, Window created in putty index exposing restoration area of teeth. C, Cellophane adapted to shape clear silicone material. D, Modified clear silicone index.

putty index. Remove the cellophane sheet after the silicone material has polymerized to leave a modified clear silicone index (Fig. 1D).

5. Evaluate the index intraorally for proper fit.
6. Isolate the teeth to be restored with dental dam (all the maxillary anterior teeth in this patient) and proceed to restore one by one. Adapt polytetrafluoroethylene tape (RS PRO White PTFE Tape; RS Components) on the adjacent teeth to isolate the proximal surfaces as shown in Figure 2A (indicating isolation of the maxillary right central incisor). Note that the polytetrafluoroethylene tape must be adapted closely, just enough to isolate proximal areas to ensure proper adaptation of the silicone index.
7. Etch and bond the tooth surfaces in the conventional manner by following the manufacturer's instructions (Fig. 2A).
8. Inject a flowable composite resin material (Tokuyama Estelite Flow quick-HF; Tokuyama) into the silicone index for the tooth to be

restored (Fig. 2B) and seat it intraorally. Remove excess from the facial or lingual side of the index. Light polymerize the composite resin for 20 second on each surface through the clear silicone index.

9. Remove the index and polymerize an additional 20 seconds on each surface to ensure complete polymerization. Note that for a multilayered procedure, the inner layer is formed with a packable composite resin material (Filtek Z350 XT; 3M) and a space is left for the final layer to be restored with flowable composite resin as described previously. Note that vent holes can be made in the clear silicone to facilitate the exit of composite resin (especially for more bulky restorations).
10. Proceed to restore the remaining teeth one by one as described in steps 7, 8, and 9. Alternately, alternate teeth can be restored simultaneously. Refine the contacts and contours followed by finishing and polishing of the restored teeth by

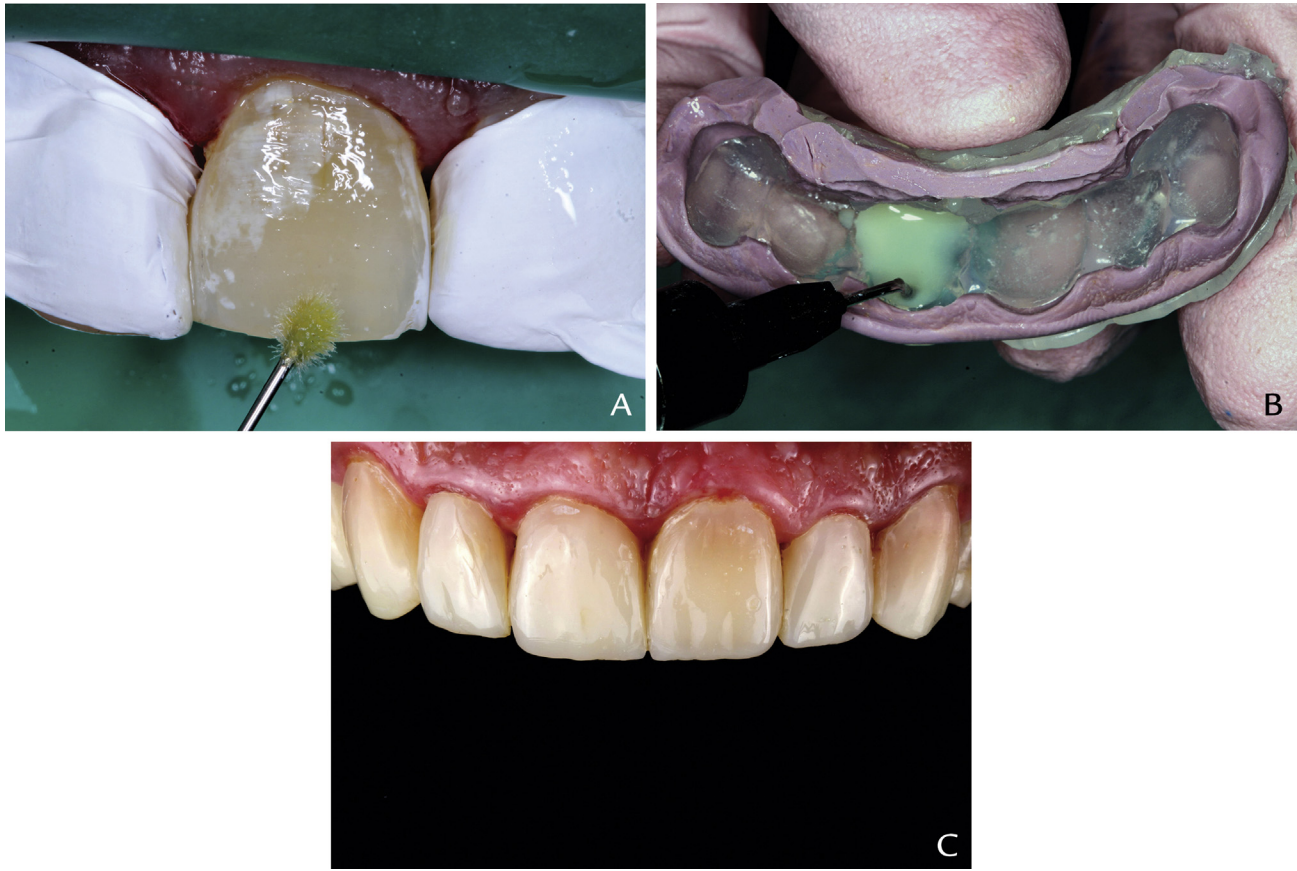


Figure 2. A, Etching and bonding of maxillary central incisor and isolation with polytetrafluoroethylene tape. B, Flowable composite resin injected into silicone index. C, Completed composite resin restorations of all maxillary anterior teeth replicating morphology of diagnostic waxing.

using a composite resin finishing kit (SHOFU) (Fig. 2C).

REFERENCES

1. Demarco FF, Collares K, Coelho-de-Souza FH, Correa MB, Cenci MS, Moraes RR, et al. Anterior composite restorations: a systematic review on long-term survival and reasons for failure. *Dent Mater* 2015;31: 1214-24.
2. Ástvaldsdóttir Á, Dagerhamn J, van Dijken JW, Naimi-Akbar A, Sandborgh-Englund G, Tranæus S, et al. Longevity of posterior resin composite restorations in adults- a systematic review. *J Dent* 2015;43: 934-54.
3. Gupta N, Singh K. Putty index: an important aid for the direct fabrication of fiber reinforced composite resin FPD. *J Indian Prosthodont Soc* 2014;14(Suppl 1):187-9.
4. Dietschi D. The natural layering concept: a breakthrough in free-hand bonding techniques. *Aust Dent Pract* 2007;18:158-65.
5. Sherwood A, Rathakrishnan M, Savadamaoorthi KS, Bhargavi P, Kumar VV. Modified putty index matrix technique with mylar strip and a new classification for selecting the type of matrix in anterior proximal/incisal composite restorations. *Clin Case Rep* 2017;5:1141-6.

Corresponding author:

Dr Pravinkumar G. Patil
 Department of Prosthodontics, Division of Clinical Dentistry
 School of Dentistry, International Medical University
 Jalan Jalil Perkasa- 19, Bukit Jalil
 Kuala Lumpur, 57000
 MALAYSIA
 Email: pravinandsmita@yahoo.co.in

Copyright © 2020 by the Editorial Council for *The Journal of Prosthetic Dentistry*.
<https://doi.org/10.1016/j.prosdent.2020.08.011>