

Content available at: <https://www.ipinnovative.com/open-access-journals>

International Journal of Oral Health Dentistry

Journal homepage: [www.ijohd.org](http://www.ijohd.org)

## Case Report

# Post-orthodontic recontouring of anterior teeth using direct composite injection technique: A case report

Karthi M<sup>1,\*</sup>, Rahul Maria<sup>1</sup>, Zaryab Momin<sup>1</sup>

<sup>1</sup>Dept. of Conservative Dentistry & Endodontics, Bhabha College of Dental Sciences, Bhopal, Madhya Pradesh, India



## ARTICLE INFO

### Article history:

Received 26-01-2023

Accepted 13-03-2023

Available online 15-04-2023

### Keywords:

Injectable technique

Preheated universal composite

digital workflow

silicone index

Direct Restoration

## ABSTRACT

Esthetics is the major concern among patients seeking dental treatment which can be hindered by discrepancies in the anterior teeth like presence of spacing and disturbances in tooth morphology. In cases where multiple spacing of anterior teeth are present, injection technique using composite can be replacement for the direct restoration technique due to its non – invasive, cost effective nature. This case report depicts the case of anterior tooth recontouring after an orthodontic treatment managed with composite injection technique using preheated universal composite and digital workflow. This technique results in marginal precision improvement and superior esthetics when planned and executed appropriately.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

In order to address the growing desire for a more realistic and natural-looking appearance, the field of restorative and cosmetic dentistry is constantly evolving. Esthetics is currently an increasing concern for patients, particularly in anterior teeth and the presence of diastema in esthetic zone may result in a displeasing smile.<sup>1,2</sup>

Diastemas exist for various reasons including disproportion between the tooth size and maxillary or mandibular arch width, tooth angulation, and tooth rotation and may also result from developmental, pathological, or iatrogenic factors etc. The anterior region composite restoration increased extensively due to a rise in patient demand for minimally invasive aesthetic rehabilitation.<sup>3,4</sup>

A variety of other techniques are available to manage such situations, including orthodontic treatment, laminate veneers, etc. It is frequently necessary to recontour anterior teeth, particularly the maxillary anterior teeth, to improve the aesthetic outcome of orthodontic therapy.<sup>5</sup>

However, in more severe deformed cases, direct free-hand composite restorations become difficult and technique-sensitive. To simplify and expedite direct build-ups in complicated cases the restoration was done using a technique known as injectable composite resin. It uses a transparent silicone index to duplicate the anatomy of a wax-up followed by stamping the composite resin directly onto the surface of the teeth, with a preheated composite. It can be used for definitive restorations to establish new vertical dimensions, and restore fractured or worn dentitions. Clinically both flowable and conventional composites have shown good physical properties, with recent studies showing no clinical differences in all evaluated outcomes during follow-up periods, they are both conservative and additive approach, without any preparation of healthy tooth.<sup>6,7</sup>

After orthodontic treatment is complete, the present case discusses the use of an injectable composite restorative approach to regulate the spacing in the anterior aesthetic zone.

\* Corresponding author.

E-mail address: [karthicrazy42@gmail.com](mailto:karthicrazy42@gmail.com) (Karthi M).

## 2. Case Report

A 20-year-old patient reported to the department of Operative dentistry, Bhabha university with the chief complaint of spacing in the upper anterior teeth, patient gave history of orthodontic treatment and was dissatisfied with the results as the orthodontist could not achieve or close the spacing present in upper anterior teeth, patient's medical history was non-contributory. On intra oral examination multiple spacing in upper anterior tooth, when measured using vernier caliper midline diastemas space was 2mm and Interdental space between right maxillary central and lateral is 1mm, lateral incisor and canine is 1mm, left maxillary central incisor and lateral incisor is 1mm, lateral incisor and canine 1mm. No dental caries was present in clinical and radiographic examination. He had a thick gingival biotype, fairly symmetrical gingival architecture, and good periodontal health. Various possible treatments was explained, but patient chose a restorative treatment, as the treatment was compactable with his financial resources. Full esthetic evaluation was carried out on patient's smile photos (Figure 1).



**Fig. 1:** Patient presented with multiple spacing in upper anterior tooth - Preoperative

Using condensation silicone and die stone, pre-operative impressions of both arches were taken. With careful consideration of height and width (Figure 2), a mock up wax was prepared from the upper right to left canine (tooth #13 to #23). A mock up try in was constructed using silicone index. The patient approved of all the mock-specifications (Figure 3), and an impression of the wax-up was used to create a transparent tray with a 2mm thickness.



**Fig. 2:** Diagnostic cast wax-up (A) Frontal view (B) Lingual view

Each tooth was separated and isolation achieved by Teflon band. Enamel etching was done with 35% phosphoric

acid for 30 seconds in the first group of teeth to be restored, rinse and air-dried. Adhesive and polymerization was done for 20 seconds. The preheated universal composite resin was injected on both the buccal and palatal surfaces of index, to achieve a better proximal composite shape. The index was then placed on the first tooth and excess material was removed using a dental probe and a scalpel then polymerized buccal and palatal on each face for 30 seconds. A water-soluble gel was applied after removing the index and light-cured for 40 seconds to restrict the oxygen inhibited layer formation. All the above procedure was repeated for all other teeth in same sequence. (Figure 4)

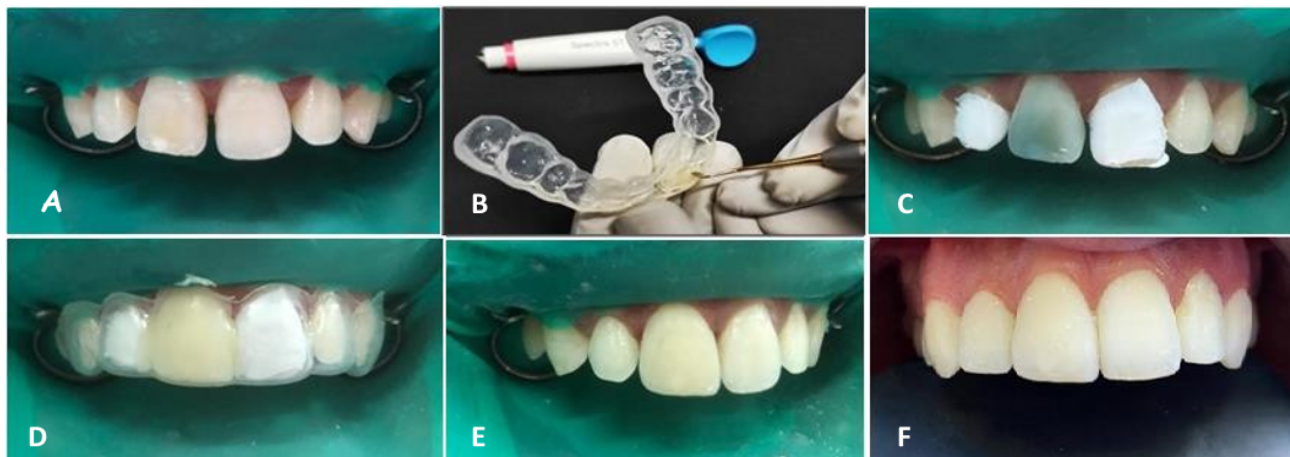
The initial polishing of all restorations was initial polished with medium and fine abrasive discs and interproximal strips in cervical embrasures. Adjustment of occlusion was then made using 100  $\mu$ m carbon paper by lateral excursion and anterior movement on both sides was checked, followed by rubber point (cones/cup/disk) used to eliminate the rough marks created by the disk. Final finishing and polishing with soft spiral to give gloss and shine. (Figure 5)

## 3. Discussion

The most important step in orthodontic therapy is teeth recontouring since irregularities in tooth form damage the results. In the past, the only viable option was indirect restorations, but since the invention of composite resins, non-invasive treatment employing direct composite buildups has gained the upper hand. Preservation of oral tissues in young people is optimal from a biological perspective.<sup>5</sup> Therefore, this case report presented the injectable composite restorative technique that employs nanohybrid universal composite is based on innovative, color-adaptive technology to mimic the patient's natural dentition containing tiny uniform-sized spherical fillers and combine them into larger clusters so they have the strength of larger hybrid and produce highly polishable surface.<sup>8</sup> Its viscosity can be varied by preheating makes it convenient to use and good marginal adaptation also increase the degree of conversion, microhardness, and reduce microleakage.<sup>9</sup>

The injectable technique's key benefits include a significant decrease in technique sensitivity and chair time with predictable results. The suggested direct restorations can also be thought of as semi-permanent, making it easier for the patient to switch to more intrusive indirect restorations in the future. At 6-month recalls the outlook of the restored anterior teeth was considered natural and aesthetical. Clinically, restorations have no fractures or marginal discoloration was seen in restoration margins.<sup>5,10</sup>

In clinical cases where a non or minimally invasive treatment approach is needed, the injectable composite restoration technique protocol helped provide an excellent esthetic correction and reshaping of anterior teeth. Also, universal composites which were used in the present case



**Fig. 3:** Chronological, illustrative images of the case management **A)** Maxillary anterior teeth were isolated with rubber dam. No preparations were achieved; **B)** The adjacent central incisor was covered with Teflon band and acid etched; **C)** The pre-heated universal composite resin warmed at 60°C and was injected on both the buccal and palatal surfaces of index; **D)** The index was then placed on the first tooth and excess of the material was removed using a dental probe and a scalpel and Photopolymerization of the composite resin through the silicone key; **E)** Clinical picture after the first set of teeth are restored, finished and polished; **F)** The procedure repeated for the other group of teeth, following the same sequence as the first tooth restored



**Fig. 4:** **A)** Facial view of final restoration after finishing and polishing of the restored teeth; **B)** Right lateral postoperative view; **C)** Left lateral postoperative view



**Fig. 5:** Facial view of the restored tooth after 1 year follow-up

by preheating resulted in high-quality restorations and good color matching.

#### 4. Source of Funding

None.

#### 5. Conflict of Interest


Nil.


#### References

1. Amaro I, Saraiva J, Gomes AC, Araújo A, Marto C, Coelho A, et al. Direct Restorations for Anterior Esthetic Rehabilitation and Smile Symmetry Recovery: Two Case Reports. *Symmetry*. 2021;13(10):1848.
2. Rapsang E, Chaudhary D, Nagpal R, Trinath T, Sharma Y. Omnicroma: One Composite to Rule Them All. *Int J Med Sci*. 2020;7(6):6–8.
3. Cerutti A, Zubani A, Nembrini E, Amato M. Advantages of Composite Direct and New Semi-Direct Techniques - Morphological Correction and Improving Esthetics of Anterior Diastema; 2022. Available from: <https://www.iris.unisa.it/handle/11386/4051653>.
4. Durrani F, Durrani F. Aesthetic Closure of Anterior Spaces in Mature Dentition. *WebmedCentral Dent*. 2013;4(12):WMC004457. doi:10.9754/journal.wmc.2013.004457.
5. Hosaka K, Tichy A, Motoyama Y, Mizutani K, Lai WJ, Kanno Z, et al. Post-orthodontic recontouring of anterior teeth using composite injection technique with a digital workflow. *J Esthet Restor Dent*. 2020;32(7):638–44.
6. Gia NR, Sampaio CS, Higashi C, Sakamoto A, Hirata R. The injectable resin composite restorative technique: A case report. *J Esthet Restor Dent*. 2021;33(3):404–14.
7. Geštakovski D. The injectable composite resin technique: minimally invasive reconstruction of esthetics and function. Clinical case report with 2-year follow-up. *Quintessence Int*. 2019;50(9):712–9.
8. Lawson N. Practice Benefits of Universal Composites. *Inside Dent*. 2021;17(8). Available from: <https://www.aegisdentalnetwork.com/id/2021/08/practice-benefits-of-universal-composites>.
9. Hendi A, Maleki D, Falahchai M, Maleki D. Composite Preheating: A Review Article. *J Dentomaxillofac Radiol Pathol Surg*. 2019;8(3):45–7.
10. Rosales AB, Carvacho DDN, Cacciuto RS, Guineo MG, Guineo MG, Fuentes CG. Conservative Approach for the Esthetic Management of Multiple Interdental Spaces: A Systematic Approach: Conservative management of multiple interdental spaces. *J Esthet Restor Dent*. 2015;27(6):344–54.

#### Author biography

**Karthi M**, Post Graduate Student  <https://orcid.org/0000-0002-9959-4085>

**Rahul Maria**, HOD  <https://orcid.org/0000-0001-5385-7735>

**Zaryab Momin**, Post Graduate Student  <https://orcid.org/0000-0002-7757-1720>

**Cite this article:** Karthi M, Maria R, Momin Z. Post-orthodontic recontouring of anterior teeth using direct composite injection technique: A case report. *Int J Oral Health Dent* 2023;9(1):74–77.