



## Case of the Month – September 2017

### **DIASTEMA CLOSURE USING A PREDICTABLE FLOWABLE RESIN COMPOSITE INJECTION TECHNIQUE – A CASE REPORT**

#### **AUTHORS**

**Dr. S. SURENDAR**, PG student, DEPARTMENT OF CONSERVATIVE DENTISTRY AND ENDODONTICS

**Dr. ABBY ABRAHAM**, MDS, Professor and HOD, DEPARTMENT OF ESTHETIC DENTISTRY

SAVEETHA DENTAL COLLEGE AND HOSPITALS, CHENNAI.

#### **INTRODUCTION**

The injectable resin composite technique is a unique and novel indirect/direct process of predictably translating a diagnostic wax-up into composite restorations. The clinical applications include emergency repair of fractured teeth and restorations, fabricating provisional restorations [1], transitional composite restorations (Class III, IV, veneers) and pediatric composite crowns, establishing incisal edge length prior to aesthetic crown lengthening and developing composite prototypes for copy milling.

Composite injection technique allows the patient and restorative team to establish parameters for occlusal function [2], tooth position and alignment [3], restoration shape and physiologic contour [4], restorative material color and texture, lip profile, phonetics, incisal edge position, and gingival orientation [5]. A clear matrix is used to replicate the diagnostic wax-up. It can be placed intraorally over the unprepared teeth and used as a transfer vehicle for the flowable composite resin to be injected and cured.

When selecting this procedure, several factors should be considered, including:

- Caries risk assessment
  
- Age
- Behavior
- Periodontal health
- Adequate remaining tooth structure
  
- Moisture-controlled field
  
- The longevity of the tooth [6]

#### **HISTORY AND EXAMINATION**



## Case of the Month – September 2017

A 25-year-old male patient presented with a chief complaint of spacing in his upper front teeth (figure 1). History revealed presence of diastema since childhood. On clinical examination, multiple diastemata were seen between the central and lateral incisors (Figures 1a to 1c) with healthy periodontal support. Patient insisted for a much less invasive treatment with minimal appointments.

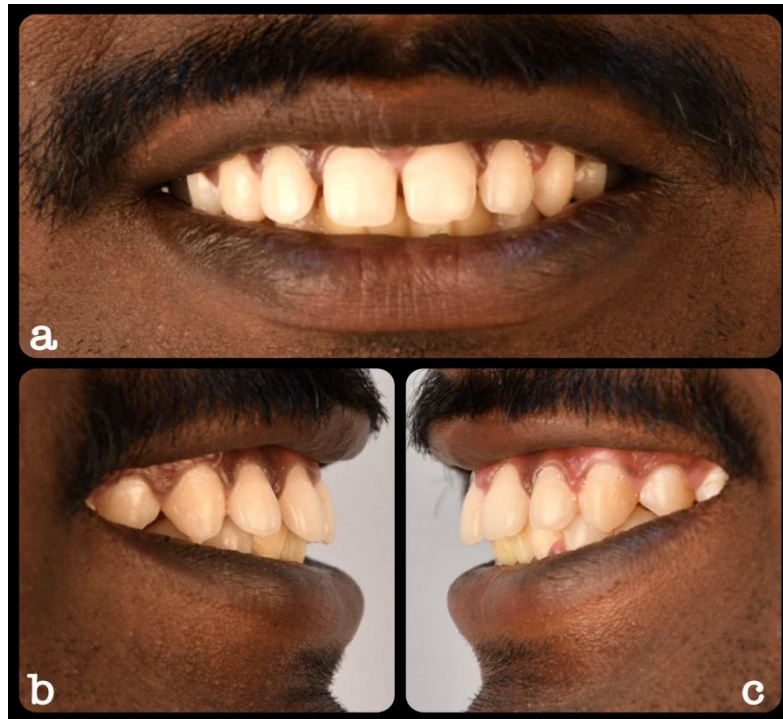


Figure 1a to c : Pre-Operative clinical pictures

Radiographic examination showed normal structures. Diagnosed to be a congenital diastema of maxillary anterior.

### TREATMENT PLANNING

Treatment planned for a single sitting smile enhancement using predictable flowable resin composite injection technique with less or no preparation of the tooth structure in maxillary incisors (tooth number - 11,12,21,22).

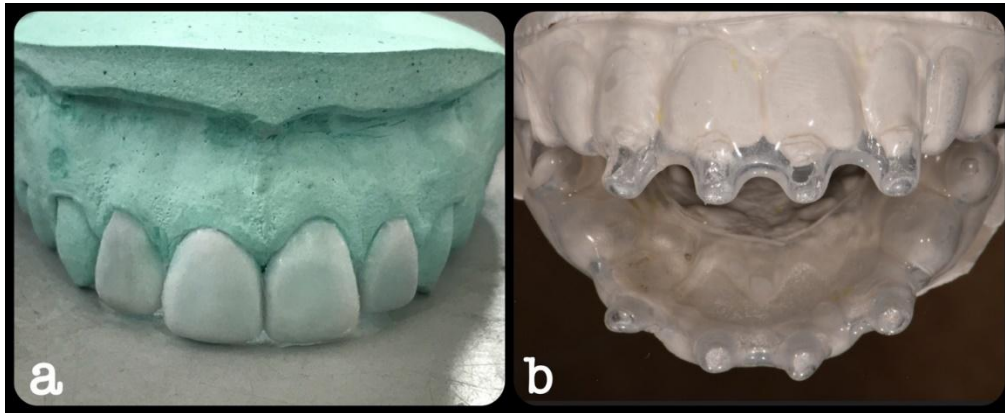


Figure 2a and b : Mock-up and Clear matrix

### CASE DESCRIPTION

After occlusal evaluation, a new mock-up was made with a diagnostic wax-up (Figure 2a). A clear polyvinyl siloxane matrix material of the diagnostic wax-up was made (Figure 2b). Each tooth was pumiced. The tooth was then separated by applying Teflon tape to the adjacent teeth (Figure 3a) for isolation. This proximal adaptation technique allowed for optimal integration of flowable resin composite in the inter-proximal area while preventing adhesion of the material to adjacent tooth surfaces [6]. Depending upon the duration of treatment, the method for bonding requires either selective spot-etching or complete etching of the tooth surfaces to be restored [1].



Figure 3a to c : (a) isolation with teflon tapes on adjacent teeth; (b) a 37% phosphoric acid gel is applied for 15 seconds and rinsed with water; (c) a single component adhesive applied.



## Case of the Month – September 2017

A 37.5% phosphoric acid semi-gel(N- Etch; Ivoclar Vivadent)was applied to the enamel surface for 15 seconds (Figure 3b), rinsed for 5 seconds, and then gently air dried. A single-component adhesive(SingleBond; 3M ESPE) was applied with an applicator to the enamel surface (Figure 3c), allowed to dwell for 10 seconds, air dried for 5 seconds and then light cured for 10 seconds using an LED curing light (Woodpecker LED D Light cure unit, PRC). The clear matrix was placedover the arch and an A-2 shaded flowable nano-hybrid resin composite (Tetric – N-Ceram; Ivoclar Vivadent) was initially injected through a small opening above each tooth (Figure 4a). The flowable resin composite was cured through the clear matrix for 40 seconds (Figure 4b). The excess polymerized resin composite(Figure 4c) was removed with a scalpel (No. 12). The incisal composite sprue was removed with a 30-fluted tapered finishing bur(Prime Dent). This restorative procedure was completed for each tooth before restoration of the next tooth(Figure 4d).

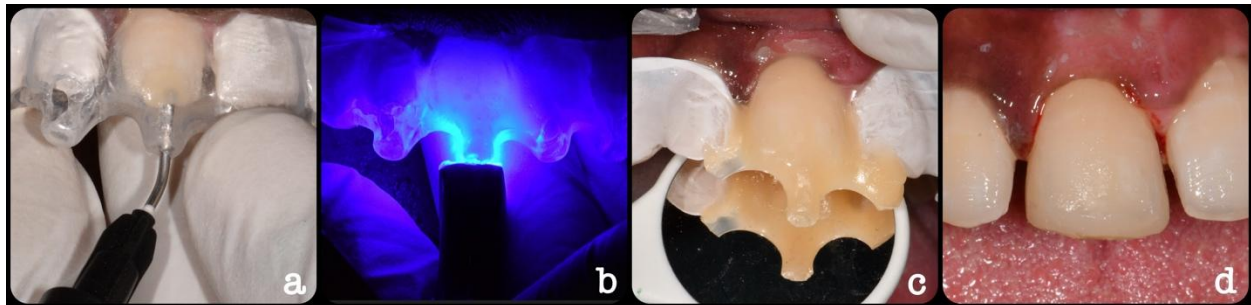
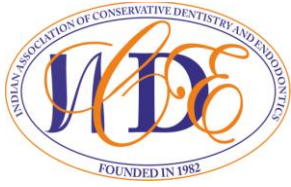


Figure 4a to d : (a) Injecting flowable composite; (b) LED curing 40secs; (c) Excess polymerized resin; (d) completed restoration.

After isolation of the adjacent central with Teflon tape, the adhesive surface preparation was completed using the total-etch technique. The same shade combination of flowable composite material was injected through a small opening in the matrix above the tooth. After each composite injection, the same restorative procedure was completed for bilateral incisors.





## Case of the Month – September 2017

An optimally finished restoration should provide a smooth surface that will prevent plaque accumulation and resist staining. The injectable composite restoration should also possess proper marginal adaptation and integrity with the ideal contours and emergence profile for improved tissue compatibility. The tooth-resin composite interface was finished using a tapered finishing diamond. Pre-polish and high-shine silicone points (PoGo enhance kit, Dentsply caulk USA) were used to smooth and polish the resin composite surface. The interproximal surfaces were smoothed with aluminum oxide finishing strips (Soflex, 3M ESPE), which were used sequentially from fine to extra-fine. The incisal edges of the resin composite were contoured with finishing and polishing disks (SoflexDisc, 3M ESPE).

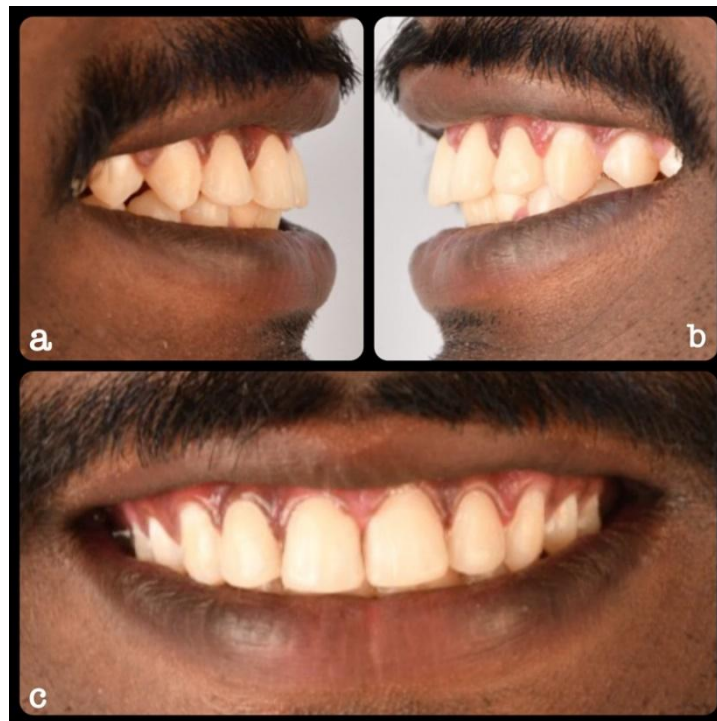


Figure 5a to c : Post Operative clinical pictures

The injectable resin composite restorations were completed and inspected in centric relation, protrusive, and lateral excursions to establish the optimal aesthetic parameters for a natural smile (Figure 5).

### DISCUSSION

The injectable resin composite technique is a valuable communication tool for increasing the patient's understanding of the clinical procedure and anticipated final result. The future clinical applications of this novel technique may provide clinicians and technicians with alternative approaches to various clinical situations while allowing them to deliver improved and predictable dental treatment to their patients.



## Case of the Month – September 2017

### CONCLUSION

Although the long-term benefits of this technique remain to be determined, the clinical results achieved in this case report shows that injectable composite restoration can be a reliable method for direct composite veneering.

### ACKNOWLEDGEMENT

**Dr. M. S. NIVEDHITHA**, MDS, Professor and HOD,  
OF CONSERVATIVE DENTISTRY AND ENDODONTICS,  
COLLEGE AND HOSPITALS, CHENNAI.

DEPARTMENT  
SAVEETHA DENTAL

### REFERENCES

1. Terry DA. Developing a functional composite resin provisional. American Journal of Esthetic Dentistry. 2012; 2:56-66.
2. Heymann HO. The artistry of conservative esthetic dentistry. J Am Dent Assoc. 1987;115(special issue):14E-23E.
3. Gürel G. The Science and Art of Porcelain Laminate Veneers. Hanover Park, IL: Quintessence Publishing; 2003.
4. Baratieri LN, Berry TG. Esthetics: Direct Adhesive Restoration on Fractured Anterior Teeth São Paulo, Brazil: Quintessence Publishing; 1998.
5. Preston JD. A systematic approach to the control of esthetic form. J Prosthet Dent. 1976; 35:393-402.
6. Terry DA, Geller W. Esthetic and Restorative Dentistry: Material Selection and Technique. 2nd ed. Chicago, IL: Quintessence Publishing; 2013.
7. Terry DA, Leinfelder KF. An integration of composite resin with natural tooth structure: The Class IV restoration. Pract Proced Aesthet Dent. 2004; 16:235-242.
8. Dr. Ernesto Enrique Diaz Guzman et al 2015  
<https://www.facebook.com/ErnestoDiazG/videos/10157841252500637/>