



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

*International Journal of Recent Scientific Research*  
Vol. 9, Issue, 11(B), pp. 29594-29597, November, 2018

**International Journal of  
Recent Scientific  
Research**

DOI: 10.24327/IJRSR

## Case Report

### MULTIPLE DIASTEMA CLOSURE USING TRAY TECHNIQUE: A CASE REPORT

**Noushad M C., Kavya Maheesan., Rakhi R., Gokul Krishna N.,  
Ashraf K and Suneetha M P**

Department of Conservative Dentistry and Endodontics, Kannur Dental College, Kannur, Kerala, India

DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0911.2890>

#### ARTICLE INFO

##### Article History:

Received 06<sup>th</sup> August, 2018  
Received in revised form 14<sup>th</sup>  
September, 2018  
Accepted 23<sup>rd</sup> October, 2018  
Published online 28<sup>th</sup> November, 2018

##### Key Words:

Composite, diastema, template, tray  
technique, esthetics

#### ABSTRACT

To smile is easy to make others smile it's a blessing. It is the prime responsibility of an esthetic dentist or a general dentist to improve the smile of a patient. Many types of altered smiles do occur and diastema is quite a common one.

**Case report:** 33 yr. old male patient with a complaint of multiple spacing from 13-23. A novel approach by the use of thermoplastic template is designed to do the restoration. Multiple space closure with a short time and accurate reproduction of details is the advantage of this customized technique

**Conclusion:** This is a novel approach for the closure of multiple diastema causing less fatigue for the clinician and patient. Inter operator bias is reduced in this technique

**Copyright © Kavya Maheesan et al, 2018**, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

#### INTRODUCTION

To have a beautiful smile is indeed a blessing. An important aspect of a beautiful smile is a dentition without spacing. Though some communities consider spacing to bring luck, a dentist and a major share of population consider it unaesthetic and not appealing. A diastema can be defined as a space >0.5mm between the proximal surfaces of two adjacent teeth.<sup>1</sup> Midline diastemata (or diastemas) occur in approximately 98% of 6 year old's, 49% of 11 year old's and 7% of 12- 18 year old's<sup>2</sup>. The continuing presence of a diastema between the maxillary central incisors in adults often is considered an esthetic or malocclusion problem<sup>1</sup>

Multitude of techniques have been employed to improve the smile by closing diastema. Orthodontic treatment is one which is usually carried out for space closure and alignment correction, but the duration of the treatment and the multiple visits often appears hectic for a patient who needs an esthetic correction. Many approaches have been done in the field of esthetic dentistry for the closure of multiple diastemas. Closure of midline diastema using free handed composite restoration or bio clear matrix system is helpful, but this is tedious when there is multiple diastema.

With the emergence of advanced and contemporary techniques, the time required for performing restorative procedures have

drastically reduced.<sup>3</sup> This is a case report presenting the closure of multiple diastema using a thermoplastic bleaching tray that would make closure of multiple spaces in the anterior region more easier and esthetic.

#### Case report

A 33-year-old male patient reported with a complaint of spacing in the anterior teeth region. His history reveals that he had the spacing from the time of permanent dentition and he had problem with smiling because of the same. Patient medical history was noncontributory. It was the first dental visit Patient wanted an esthetic correction for the closure of the multiple spaces because it restrained him from his self-confidence. On examination there was gap in between his social six from canine to canine in the maxillary arch. (Fig: 1,2) Overjet was more than 3mm.

The patient was explained about the reason for his diastema being tooth material arch length discrepancy (Bolton's discrepancy). Various treatment modalities were explained to the patient such as

1. Fixed orthodontic therapy
2. Ceramic veneering
3. Composite veneering
4. Full coverage restorations (crown)
5. Direct composite build up

\*Corresponding author: **Kavya Maheesan**

Department of Conservative Dentistry and Endodontics, Kannur Dental College, Kannur, Kerala, India

The treatment cost, time and outcome were explained to the patient and it was his choice to go for a direct composite restoration as it was a minimally invasive and that can be done in a short span of time. The entire procedure was done in two sittings in the first appointment pre-operative photographs of the patient was recorded, and shade selection was done.



Fig 1



Fig 2

Periodontal consultation was done to evaluate the frenal attachment. On periodontal examination the frenal attachment was not papilla penetrating so the patient was not advised to go for frenectomy, patient underwent an oral prophylaxis, primary impression was made using irreversible hydrocolloid (Gc Flexceed Vinyl Poly Siloxane).

Diagnostic casts were made using die stone and the diagnostic models were checked and removed of irregularities. A mock up was prepared using an expired composite from 13 to 23 by maintaining contacts and contour to the best as possible using cellophane strips. (Samit Matrix Strips (Fig:3)



Fig 3

Template for the treatment was made on this mock up cast using thermoplastic sheets (ashvac thermoplastic sheets of 1mm thickness) (Fig: 5) The base of the models were trimmed flat and it was loaded to the vacuum former to create the thermoplastic tray.

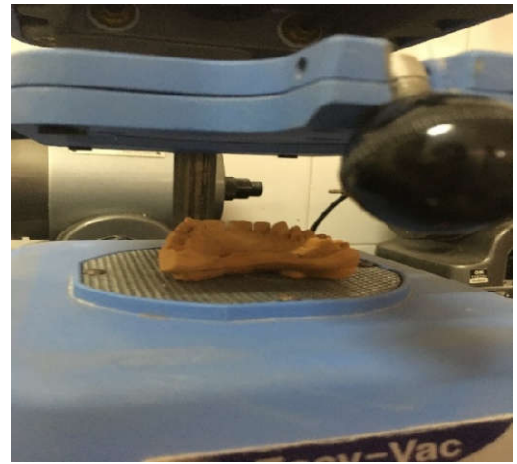


Fig 4



Fig 5

The tray was trimmed 1mm above the cervical region of the teeth inspected for any rough borders which was later removed. Interdentally the tray was cut longitudinally from 13 to 23 using a No 15 BP blade and the passage of cellophane strip was confirmed. (Fig: 6)



Fig 6

Teeth from 13 to 23 on the proximal aspects were etched using etchant (d-tech 37% phosphoric acid etching gel) (Fig:7), facial and palatal surfaces were avoided. Teeth were dried and watched for the frosty white appearance.



Fig 8

After isolation Bonding was done using bonding agent (One coat Bond SL Coltene) and light cured for 20s according to the manufacturer's instructions. Composite of shade A2 (3M ESPE Filtek Z250 XT) was placed on teeth's etched surfaces by free handed technique (Fig:9)

The thermoplastic template was adapted, the excess composite which came out through the interdental spaces were removed, and cellophane strips were passed interdentally. Light curing was done for 2 mins. Fig: 10

The remaining flashes were removed and finishing and polishing was done using (shofu polishing kit CA)



Fig 9

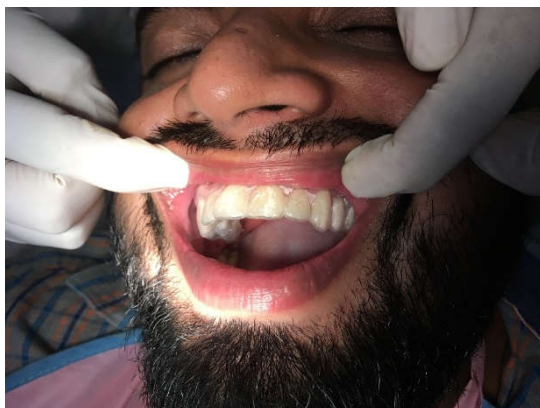


Fig 10

Post-operative photograph showing satisfactory results



Pre-treatment photograph



Post treatment photograph

## DISCUSSION

A space between adjacent teeth is called a "diastema". Maxillary midline diastema is one of the most frequently seen malocclusions and its incidence ranges from 1.6% to 25.4% and is inversely proportional to age<sup>4</sup>. Maxillary anterior spacing is often considered unaesthetic by the general population. Treating the midline diastema is a problem for the dental practitioner as many different etiologies are reported to be associated with it.<sup>5</sup> A midline diastema usually is part of normal dental development during the mixed dentition. However, several factors can cause a diastema that may require intervention. An enlarged labial frenum has been blamed for most persistent diastemas, but its etiologic role now is understood to represent only a small proportion of cases. Other etiologies associated with diastemas include oral habits, muscular imbalances, physical impediments, abnormal maxillary arch structure, and various dental anomalies<sup>6</sup>

When to treat and how to treat is a major problem in the case of diastema, that is to intervene or not.

Sanin et al developed a method that could predict whether the space would close spontaneously in the developing dentition. This method is based on millimeter measurements in the early mixed dentition and is claimed to have an accuracy of 88%. As the size of the diastema increases the possibility of space closure without treatment reduces.

Sanins prediction is

- For 1mm space in the early mixed dentition the possibility of spontaneous space closure is 99%;
- For a 1.5 mm space the possibility is 85%;
- For a 1.85 mm diastema it is 50%;
- For a 2.7 mm space the possibility of closure without treatment is only 1%.

The measurement should be made after the eruption of the lateral incisors. Hence it is advisable to intervene early if the midline diastema is more than 1.85 mm after the eruption of the permanent lateral incisors.<sup>7</sup>

The treatment of diastema is based on the etiology and the patients will, ie either an orthodontic intervention or combined surgical and orthodontic procedures or restorative approaches can be done.

Direct composite restoration is the simplest among all procedures for diastema closure. Direct composite resins in diastema closure cases allow dentist and patient complete control in formation of natural smile.<sup>8</sup> In terms of aesthetic dentistry, these restorations offer numerous advantages that other possible treatment options such as ceramic veneers and orthodontic treatment do not have. They are kinder to the opposing dentition compared to ceramic materials<sup>9</sup>. Recent aesthetic composite resin materials have similar physical and mechanical properties to that of the natural tooth and possess an appearance like natural dentin and enamel<sup>10</sup>

Doing a free handed composite is the easiest for a well experienced practitioner for the closure of midline diastema. The scenario is different when it comes to multiple diastema and for a beginner it is difficult to go for a free-handed technique. With the help of template like putty matrix the accurate measurements can be recorded added or divided using biometric guidelines.<sup>11</sup> The problem with putty matrix is again we have place incremental composite to each tooth and mold it at the chair side. The advantage of using a thermoplastic tray is composite can be placed at one go and the tray can be adapted just as the way we do to make an impression. It is less time consuming and as a mock up cast is prepared after exact measurements so inter operator bias is minimal. On the other hand recent studies also showed that direct composite resin restorations are considered functional, stable, aesthetic, and cheaper restorations completed in less chair time by using appropriate techniques for patients with appropriate occlusion<sup>12, 13</sup>

Multiple shades or mixing up of the shades is a limitation of this technique. Disadvantages of direct composite resin restorations compared to some indirect porcelain alternatives is that Most composite materials possess less fractural toughness, shear, and compressive strength and are not ideally suited for ultra-high-stress areas found in certain clinical situations<sup>14</sup>

## CONCLUSION

This is a novel approach for the closure of multiple diastema in an accurate way with less fatigue for the patient and the operator. Utilizing this technique, it is possible to achieve marked improvement in esthetics thereby improving overall patient quality of life.

## References

1. Adams CP. Relation of spacing of the upper central incisors to abnormal frenum labii and other features of the dentofacial complex. *Am Dent J.* 1954;74:72-86.
2. Foster TD, Grundy MC. Occlusal changes from primary to permanent dentitions. *British journal of orthodontics.* 1986;13(4):187-93.
3. Jha S AS, Karale R, Santhosh L, Kapadia A Novel Approach for the Closure of Multiple Diastema: A Clinical Technique. *J Oper Dent Endod.* 2017;2(2):84-7.
4. Keene HJ. Distribution of diastemas in the dentition of man. *American Journal of Physical Anthropology.* 1963;21(4):437-41.
5. Becker A. The median diastema. *Dental Clinics of North America.* 1978;22(4):685.
6. Oesterle LJ, Shellhart WC. Maxillary midline diastemas: a look at the causes. *Journal of the American Dental Association (1939).* 1999;130(1):85-94.
7. Sanin C, Sekiguchi T, Savara B. A clinical method for the prediction of closure of the central diastema. *ASDC journal of dentistry for children.* 1969;36(6):415.
8. Dale B, Aschheim K. *Esthetic Dentistry: A Clinical Approach to Techniques and Materials*, vol. 11. Lea and Febiger, Philadelphia, Pa, USA. 1993.
9. Magne P, Belser UC. Porcelain versus composite inlays/onlays: effects of mechanical loads on stress distribution, adhesion, and crown flexure. *International Journal of Periodontics & Restorative Dentistry.* 2003;23(6).
10. Bağış B, Bağış H. Porselen laminate veneerlerin klinik uygulama aşamaları: Klinik bir olgu sunumu. *Ankara Üniversitesi Diş Hekimliği Fakültesi Dergisi.* 2006;33(1):49-57.
11. Gillen RJ, Schwartz RS, Hilton TJ, Evans DB. An analysis of selected normative tooth proportions. *The International journal of prosthodontics.* 1994;7(5):410-7.
12. Prabhu R, Bhaskaran S, Prabhu KG, Eswaran M, Phanikrishna G, Deepthi B. Clinical evaluation of direct composite restoration done for midline diastema closure—long-term study. *Journal of pharmacy & bioallied sciences.* 2015;7(Suppl 2):S559.
13. Khashayar G, Dozic A, Kleverlaan C, Feilzer A, Roeters J. The influence of varying layer thicknesses on the color predictability of two different composite layering concepts. *Dental Materials.* 2014;30(5):493-8.
14. Stappert CF, Ozden U, Gerds T, Strub JR. Longevity and failure load of ceramic veneers with different preparation designs after exposure to masticatory simulation. *The Journal of prosthetic dentistry.* 2005;94(2):132-9.

\*\*\*\*\*