International Journal of Integrative Dental and Medical Sciences (IJIDMS)
Website: https://ijidms.com/
ISSN: 3049-4222
Vol. 2, Issue 1, Jan-Jun, 2026
Page No.: 09-15

Case Study

Anterior Diastema Closure Using Frenectomy and Direct Composite Resin Restoration: A Case Report

Pradnya Bansode[1], Seema Pathak[2], Madhuri Ambhure[3], Manav Modi[4]*

[1]*Professor & Head, Dept. of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Chhatrapati Sambhajinagar*

[2]*Associate Professor, Dept. of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Chhatrapati Sambhajinagar*

[3]*Associate Professor, Dept. of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Chhatrapati Sambhajinagar*

[4]*Student, Dept. of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Chhatrapati Sambhajinagar*

Corresponding Author:
Dr. Manav Modi

Email:
dr.pradnya_mds@rediffmail.com, seemadpathak@gmail.com, mbwavdhane@gmail.com, manavmodi8224@gmail.com

Doi: *10.62896/ijidms.2.1.02*

Conflict of interest: *NIL*

Article History
Received: 03/12/2025
Accepted: 19/01/2026
Published: 20/01/2026

Abstract:
Midline diastema (MD) is defined as a space greater than 0.5 mm between the proximal surfaces of fully erupted maxillary or mandibular central incisors, with a higher prevalence in the maxillary arch. It is commonly observed during the mixed dentition phase and is considered a normal developmental finding, often closing spontaneously after the eruption of permanent maxillary canines. Persistence of MD into adulthood is usually associated with specific etiological factors such as tooth-size discrepancies, excessive incisal overlap, abnormal incisor angulation, generalized spacing, and aberrant labial frenum attachment. A high or hypertrophic labial frenum with fibers extending into the interdental papilla plays a significant role in the development and maintenance of MD by exerting continuous tensile forces that interfere with space closure and increase the risk of relapse. Therefore, elimination of this etiological factor through frenectomy is often recommended prior to restorative intervention. Management of MD may involve orthodontic, surgical, restorative, or multidisciplinary approaches based on the underlying cause. Diastemas primarily caused by tooth-size discrepancies are particularly suitable for restorative management. Direct composite resin restorations provide a conservative, cost-effective, and aesthetically predictable treatment option, especially with advances in materials and techniques. This case report highlights the importance of performing frenectomy before direct composite resin closure to achieve stable, functional, and aesthetically pleasing outcomes.

Keywords: Anterior space closure, Composite resin restoration, Indirect putty, Midline diastema

INTRODUCTION

Midline diastema (MD) is defined as a space of varying magnitude between the crowns of fully erupted maxillary or mandibular central incisors. Keene described MD as anterior midline spacing greater than 0.5 mm between the proximal surfaces of adjacent teeth. The prevalence of MD is higher in the maxillary arch (14.8%) than in the mandibular arch (1.6%).[1] MD may be observed in primary, mixed, or permanent dentition and is considered a normal developmental finding during the eruption of permanent maxillary incisors. In many cases,

spontaneous closure occurs following the eruption of maxillary canines.[2]

The incidence of midline diastema varies with age and racial background. Persistence of the space into adulthood is usually associated with specific etiological factors. The most common causes include tooth-size discrepancies and excessive vertical overlap of the incisors. Other contributing factors include aberrant or high labial frenum attachment, mesiodistal angulation of incisors, generalized spacing, abnormal labiolingual inclination, and certain pathological conditions.[3]

Among these, a high or hypertrophic labial frenum with fibers extending into the interdental papilla plays a significant role in the development and persistence of MD. An abnormal frenum exerts a continuous tensile force on the interdental tissues, which can interfere with both natural and restorative space closure and increase the risk of relapse. Therefore, performing frenectomy before restorative intervention is often recommended to eliminate the etiological factor and enhance long-term stability and aesthetic outcomes.[4]

Management of midline diastema may involve orthodontic, restorative, surgical, or multidisciplinary approaches, depending on the underlying etiology.[5,6] Diastemas primarily caused by tooth-size discrepancies are particularly suitable for restorative management.[7] Direct composite resin restorations have gained popularity due to their conservative nature, cost-effectiveness, and improved aesthetic properties. Advances in composite materials and techniques, such as the use of a palatal silicone index, have further enhanced predictability and efficiency in anterior diastema closure.[8,9]

This case report highlights the importance of frenectomy as an adjunctive procedure prior to direct composite resin closure of midline diastema to achieve stable, functional, and aesthetically pleasing results.

CASE REPORT

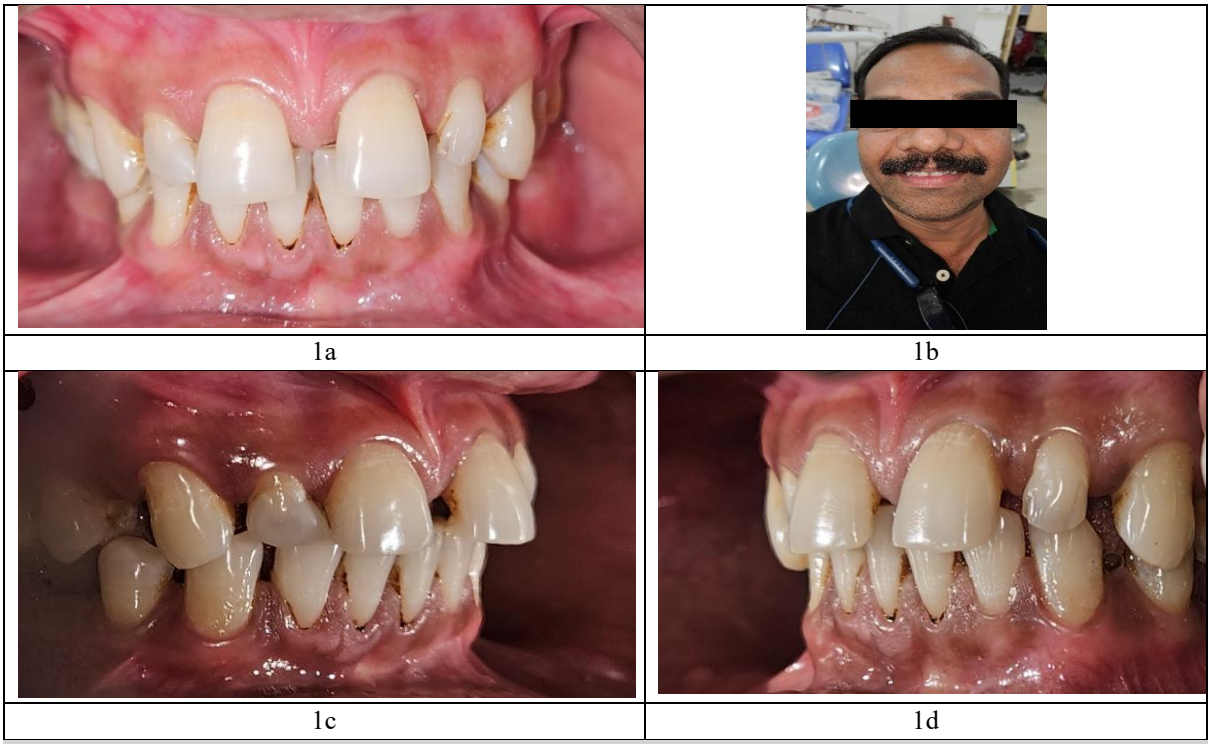
A 40-year-old male patient reported to the Department of Conservative Dentistry and Endodontics, Government Dental College and hospital, Chhatrapati Sambhajinagar with a chief complaint of gap between his upper front teeth. Aesthetics was the main concern.

CLINICAL EXAMINATION

Intraoral examination Upper Midline Spacing from 13 to 23

Microdontia with 12,22

Labial Frenum - Hypertrophic - Extending between the central incisors - Inserting into the palate with blanching upon pulling



1a | 1b

1c | 1d

Fig-1 Preoperative photographs of the patient: 1a Full retracted view showing maxillary anterior spacing with high frenum, 1b Extraoral smile, 1c,1d Right and Left Lateral retracted views showing 12.22 microdontia

International Journal of Integrative Dental and Medical Sciences (IJIDMS)
Website: https://ijidms.com/
ISSN: 3049-4222
Vol. 2, Issue 1, Jan-Jun, 2026
Page No.: 09-15

PROVISIONAL DIAGNOSIS

Midline Diastema with High Frenal Attachment

TREATMENT PLAN

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

1. Fixed orthodontic therapy
2. Ceramic veneering
3. Composite resin restoration
4. Full coverage restorations (crown)

Frenectomy followed by composite resin restoration using indirect putty index was taken into consideration.

PROCEDURE

Parient was explained about the treatment and an informed written consent was obtained from the patient.

Frenectomy was carried out under local anaesthesia with incision using No. 11 Bard Parker blade. In this technique, two paralleling incisions were made on either side of the frenum to the depth of the underlying bone. The free marginal tissues on the mesial side of the central incisors were not disturbed. The wedge of tissue was picked up with tissue forceps and excised with tissue shears at the area close enough to the origin of the frenum to provide a desirable cosmetic effect. Sutures were placed to identify the free tissue margins on either side of the removed tissue, and periodontal pack (Coe-pak) was placed for a week .

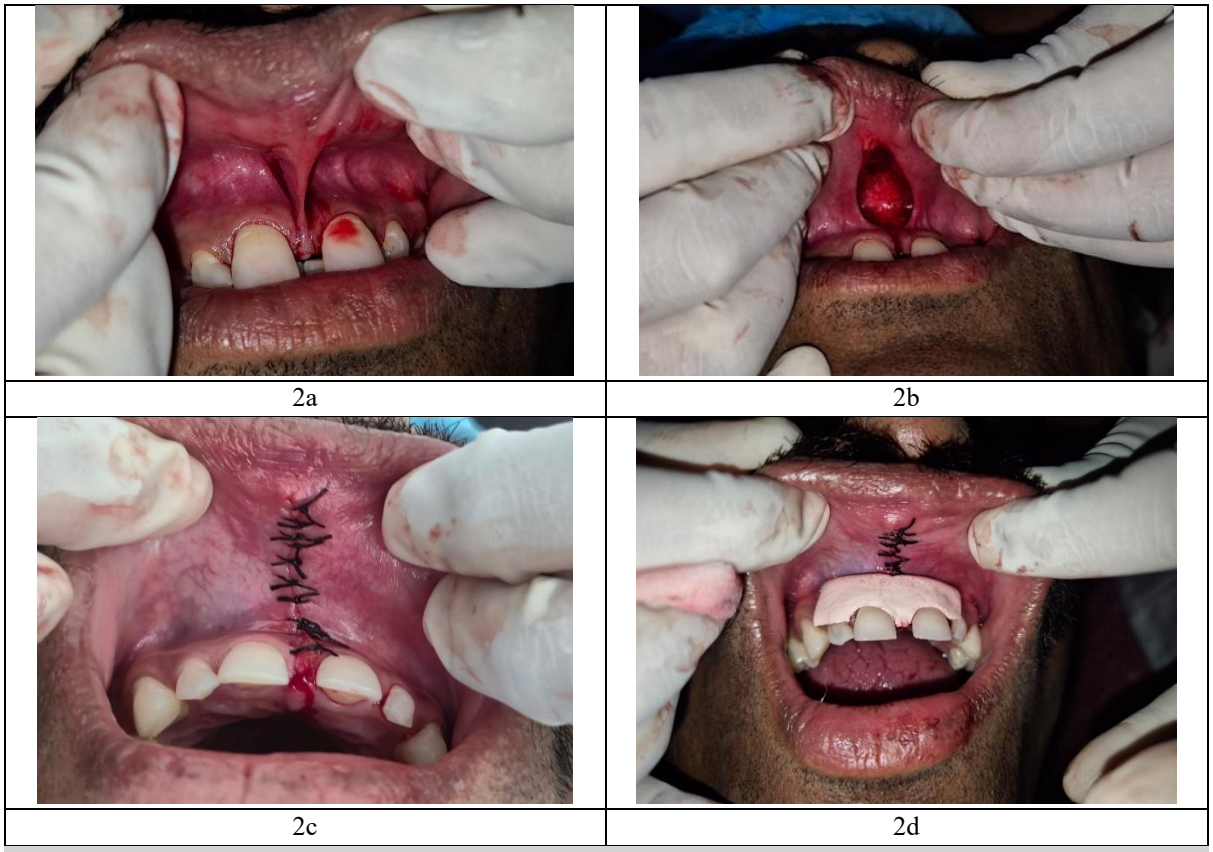


Fig 2 Frenectomy procedure: 2a Two Lateral Incisions, 2b Excision of frenum and dissection of fibres, 2c Suturing, 2d Application of coe pack

Patient was advised to return after a week for suture removal and recalled after 7 days for his restorative work.

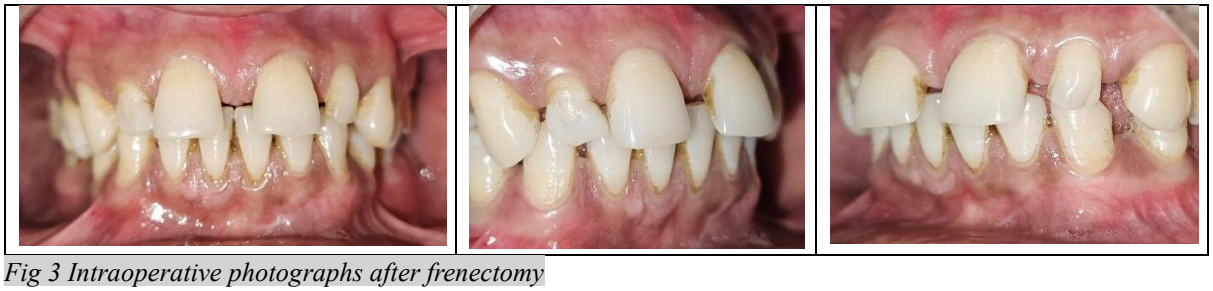


Fig 3 Intraoperative photographs after frenectomy

International Journal of Integrative Dental and Medical Sciences (IJIDMS)
Website: https://ijidms.com/
ISSN: 3049-4222
Vol. 2, Issue 1, Jan-Jun, 2026
Page No.: 09-15

Preliminary impression of both the arches were made by using alginate impression material and preliminary cast was prepared. Space closure on cast was done and a mock up was made. A palatal putty index was prepared using the cast.

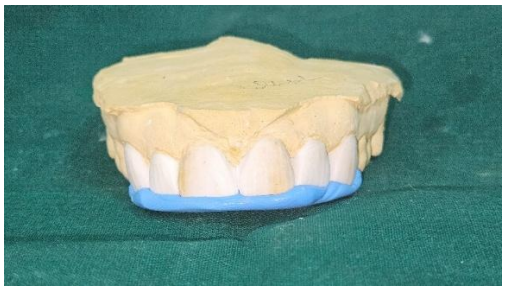
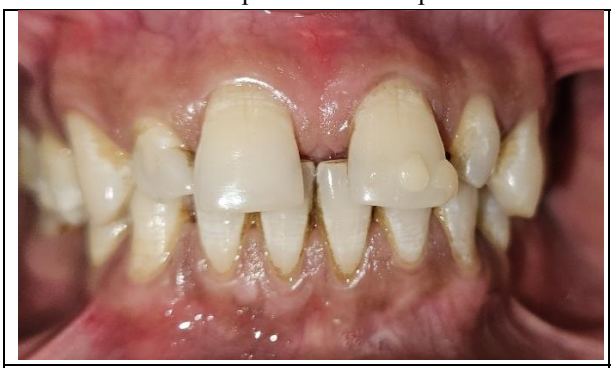


Fig 4 Wax mock up on Cast with putty index fabricated

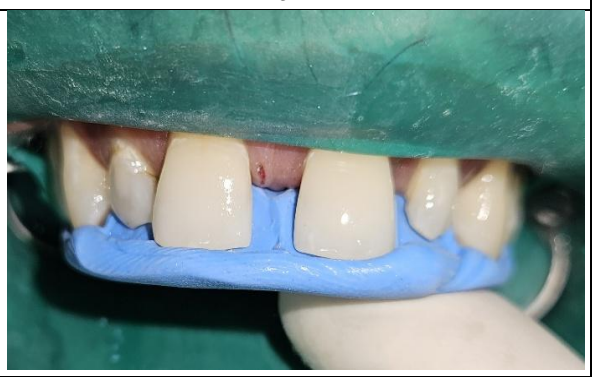
Shade selection was carried out by using button technique. Etching with 37% phosphoric acid for 15sec followed by thorough rinsing and bonding with 5th generation bonding agent was done. Then palatal index was placed on palatal surface of anterior teeth and composite resin was placed. Once the palatal index is made, putty index was removed and the remaining teeth surfaces were restored by layering technique. Finishing, polishing of all restored teeth was done with yellow banded bur, rotary discs and polishing with polishing paste and cup.



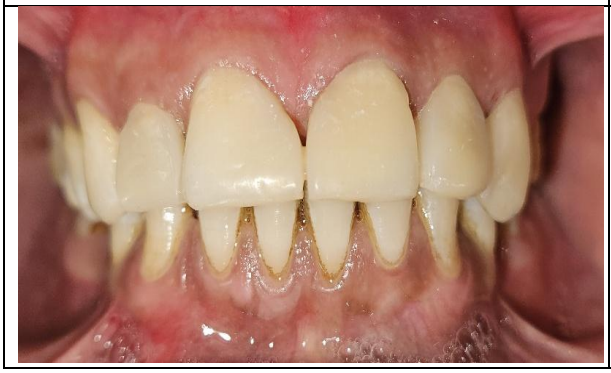
5a

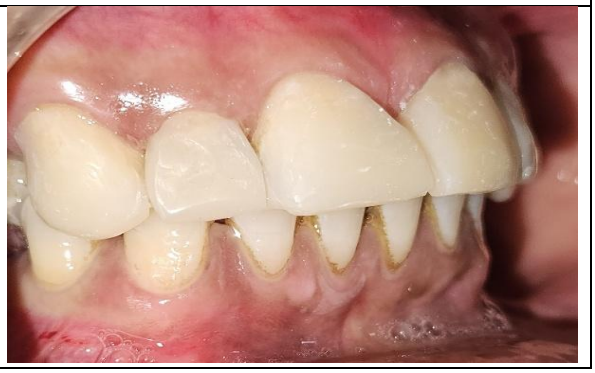
5b

5c



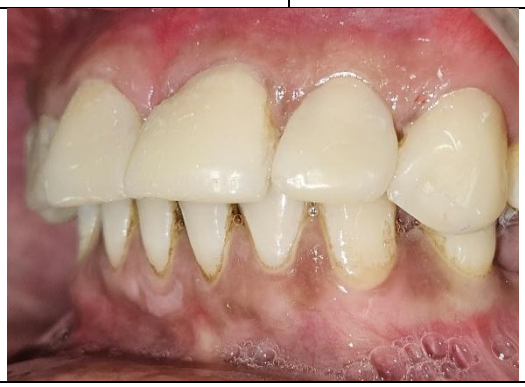
5d





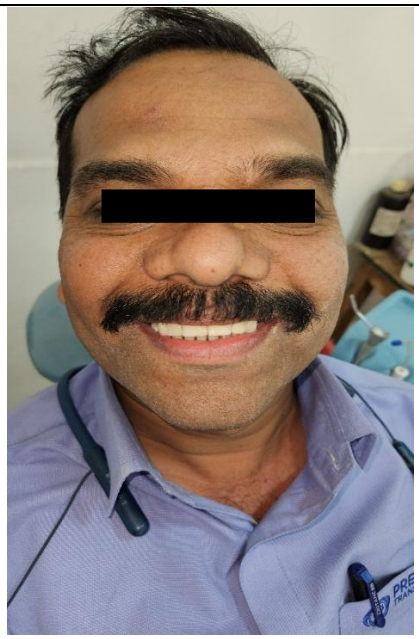
International Journal of Integrative Dental and Medical Sciences (IJIDMS)
Website: https://ijidms.com/
ISSN: 3049-4222
Vol. 2, Issue 1, Jan-Jun, 2026
Page No.: 09-15

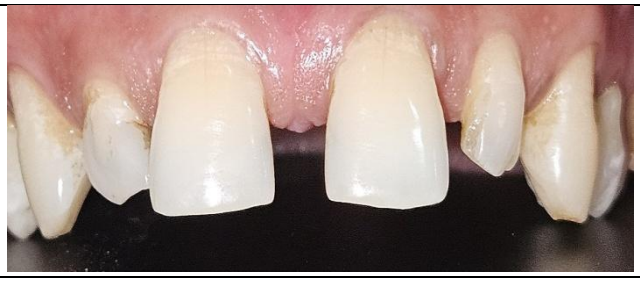
5e | 5f



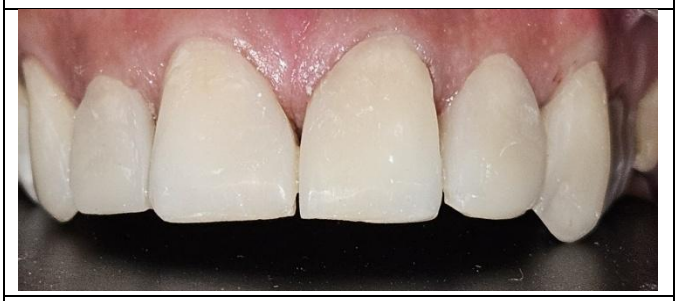
5g

Fig 5 Restorative Work; 5a Shade selection ususing button technique, 5b Etchant application, 5c Bonding agent Application, 5d Putty index seated in mouth, 5e-f-g Final postoperative photographs after finishing and polishing





6a



6b

Fig 6a Postoperative extraoral view, 6b Before vs After Contraster Views

DISCUSSION

With the increasing emphasis on minimally invasive dentistry, direct composite veneering has become a preferred restorative approach for achieving predictable aesthetic outcomes while preserving maximum tooth structure. Advances in contemporary composite restorative materials have significantly enhanced their physical, mechanical, and optical properties. When properly manipulated, these materials can produce high-quality aesthetic restorations with adequate wear resistance and satisfactory long-term clinical performance. Compared to ceramic restorations, direct composite veneers are considered a more conservative aesthetic option, as they require minimal or no tooth preparation.[8,9]

Successful aesthetic rehabilitation of anterior diastema, however, depends not only on restorative techniques but also on the management of underlying etiological factors. In cases associated with a high or aberrant labial frenum, performing frenectomy prior to restorative intervention is essential. An abnormal frenum can exert continuous tensile forces on the interdental papilla, interfering with space closure and increasing the risk of relapse. Frenectomy performed before composite restoration allows favorable soft-tissue healing, improves gingival contour and emergence profile, and provides a stable soft-tissue environment that supports long-term maintenance of diastema closure. [3,4]

Direct resin veneering may be accomplished using freehand sculpting techniques; however, this approach is often technique-sensitive, time-consuming, and operator-dependent, particularly when multiple teeth are involved. To simplify composite placement and improve procedural predictability, the use of a customized palatal silicone putty index has been advocated. This technique reduces chairside time and offers better control over tooth morphology, symmetry, and emergence profile, thereby facilitating optimal aesthetic outcomes.[10,11]

The main limitation of the indirect putty index technique is the requirement for a diagnostic wax-up and accurate fabrication of the silicone index. Nevertheless, the use of a palatal index provides a significant advantage by eliminating the need for extensive intraoral sculpting of dental anatomy. The combined approach of frenectomy followed by direct composite veneering using a palatal index represents a conservative, efficient, and aesthetically predictable treatment modality for the management of anterior diastema.[7,12]

CONCLUSION

Successful management of midline diastema requires a thorough understanding of its etiology and a carefully planned, sequential treatment approach. In cases associated with an aberrant labial frenum, performing frenectomy prior to restorative intervention is crucial to eliminate soft-tissue pull and enhance the long-term stability of space closure. Direct composite veneering, when combined with a palatal silicone index, offers a minimally invasive, efficient, and cost-effective solution with predictable aesthetic outcomes. The integration of surgical and restorative procedures, as demonstrated in this case, emphasizes the importance of addressing etiological factors to achieve stable, functional, and harmonious smile aesthetics.

References:

1. Keene HJ. Distribution of diastemas in the dentition of man. *Am J Phys Anthropol*. 1963;21:437-441.
2. Broadbent BH, Woolf RM, Broadbent BH Jr. Changes in the human face during growth and development. *Angle Orthod*. 1975;45:57-74.
3. Edwards JG. The diastema, the frenum, the frenectomy: a clinical study. *Am J Orthod*. 1977;71:489-508.
4. Campbell PM, Moore JW, Matthews JL. Orthodontically corrected midline diastemas: A histologic study and surgical procedure. *Am J Orthod*. 1975;67:139-158.
5. Huang WJ, Creath CJ. The midline diastema: A review of its etiology and treatment. *Pediatr Dent*. 1995;17:171-179.
6. Proffit WR, Fields HW, Larson B, Sarver DM. *Contemporary Orthodontics*. 6th ed. St. Louis: Elsevier; 2019.
7. Chu SJ, Tarnow DP. Managing esthetic challenges with anterior diastema. *J Esthet Restor Dent*. 2013;25:3-15.
8. Baratieri LN, Monteiro S Jr, Andrada MA, Vieira LC, Cardoso AC. *Esthetic Restorations in Anterior Teeth*. Chicago: Quintessence; 1995.
9. Terry DA. Direct applications of a nanocomposite resin system: Part 1—The evolution of contemporary composite materials. *Pract Proced Aesthet Dent*. 2004;16:417-422.
10. Gresnigt MM, Kalk W, Özcan M. Randomized controlled clinical trial of direct laminate veneers with two micro-hybrid resin composites. *J Dent*. 2012;40:766-775.
11. Magne P, Belser UC. *Bonded Porcelain Restorations in the Anterior Dentition*. Chicago: Quintessence; 2002.
12. Dietschi D. Layering concepts in anterior composite restorations. *J Adhes Dent*. 2001;3:71-80.

*****